

Qualitative study of gender and digital technologies: Ethiopia report

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Executive Summary

Over the past decade, Ethiopia has witnessed a rapid yet uneven digital transformation. Telecom liberalisation, network expansion, and government digitalisation efforts have spurred mobile adoption. But while SIM card subscriptions increased from 20.5 million in 2012 to 69.1 million by 2022, internet penetration remains low, with fewer than one-fifth of Ethiopians online as of early 2024. Persistent structural barriers include limited electricity (available to roughly 55% of households), high data costs relative to a daily income averaging about USD 2, and low digital literacy, particularly in rural areas. Smartphone affordability is a major hurdle, and gender inequalities exacerbate these challenges: women face male gatekeeping, socio-cultural expectations, and limited education, especially outside urban centres. Consequently, only 6 % of Ethiopian women own mobile phones compared to 33 % of men, and women report higher exposure to online harassment.

Against this backdrop, this study, which is part of the multi-country After Access survey by Research ICT Africa, examines how women in Ethiopia engage with digital technologies and what enables or hinders their use. It examines whether digital tools support women's livelihoods, what outcomes they experience, and how intersections of age, profession, and community affect their engagement. Four population groups were selected to capture urban, rural, and conflict contexts: adolescent girls in Addis Ababa and Semera, female teachers in Addis Ababa and Mekelle, women's collectives in Mekelle and Hawassa, and community health workers (CHWs) in Semera, the nearby Logiya, and Hawassa. The research comprised 152 semi-structured interviews, as well as focus groups in which a total of 55 women participated. Participants were recruited through purposive, multi-stage sampling via schools, clinics, and community leaders, with snowball sampling used for participants with disabilities. Data was collected in Amharic and Tigrigna, translated into English, and analysed using a thematic framework that encompassed context and population profiles, everyday practices, lived outcomes, and gendered barriers. Sampling sites in Addis Ababa, Hawassa, Semera, and Mekelle reflect varied digital infrastructure, socio-cultural compositions, and political environments. By documenting diverse experiences, this study reveals common patterns and unique challenges that should inform tailored, context-aware interventions to bridge Ethiopia's digital gender divide and foster inclusive digital futures.

The study involved women and girls with diverse age ranges, educational levels and occupations, and from different geographic contexts. Adolescents, mainly 18 to 19-year-old students, showed that there were stark contrasts between their experiences in urban Addis Ababa and semi-rural Semera: girls in Addis acquired smartphones earlier and were more digitally literate, whereas their peers in Semera often started with basic phones, obtained smartphones later, often via family or spousal support, and learned through self-teaching or peer guidance. Teachers ranged from their twenties to their fifties; those in Addis benefited from better infrastructure and wider device ownership (including laptops and tablets), while teachers in conflict-affected Mekelle relied mainly on phones and faced unstable networks and power cuts. Women's collectives split along generational lines: younger, university-educated Gorzo activists in Mekelle used advanced apps and multiple devices for advocacy, creative work, and entrepreneurship, whereas older self-help group (SHG) members in Hawassa relied only on phones and basic apps for micro-business and social connections. CHWs in urban

Hawassa had greater digital exposure and owned multiple devices, whereas those in Semera and the nearby Logiya often relied on mobile data and lacked formal digital training.

Across all groups, mobile phones were the primary digital device. Messaging apps, especially Telegram and WhatsApp, were integral for communication, coordination, and staying informed, while social media platforms (Facebook, TikTok, YouTube) were used daily for entertainment, information, and maintaining networks; younger participants gravitated towards TikTok, whereas older users favoured Facebook. Teachers and CHWs also used e-mail, Google tools, and YouTube for lesson planning, health education, and professional development; some experimented with AI tools, such as ChatGPT, although adoption remained low. Women's collectives and adolescent girls engaged with online communities for inspiration and activism. CHWs and teachers participated in professional networks and social groups to exchange resources and support one another. Screen time varied widely: adolescents and Gorzo members often spent several hours online for learning, socialising, and occasional income generation, whereas SHG members and older teachers or CHWs used devices more sparingly because of household duties, limited connectivity, or older devices.

Digital technology enabled improved access to educational and professional resources, especially for adolescents and teachers who used online tutorials, Google searches, and YouTube to supplement school lessons and teaching materials. All groups reported enhanced communication through staying in touch with family, colleagues, and community members, as well as greater efficiency in tasks such as lesson planning, reporting, and small-business transactions. Personal empowerment and confidence grew through exposure to role models, self-expression on social media, and participation in supportive online communities (e.g. women-only channels, disability networks). Economic opportunities emerged: some adolescents and Gorzo members sold crafts or freelanced online; SHG women utilised social media and mobile banking to run micro-businesses; teachers and CHWs supplemented their incomes through mobile banking and occasional e-commerce. Assistive technologies like Job Access With Speech (JAWS), TalkBack, and Non-Visual Desktop Access (NVDA) empowered visually impaired teachers and CHWs to access information and work independently. Several factors enabled positive outcomes. Access to affordable devices and connectivity was critical, as were peer support networks, personal motivation, and community resources such as Wi-Fi in schools and training offered through women's collectives. Adolescents and teachers noted how family support, whether from parents or siblings, and peer encouragement helped them learn and explore new apps. At the same time, CHWs benefited from workplace infrastructure and informal training among colleagues.

Despite these gains, structural barriers remained pervasive. The high cost of devices and mobile data, unreliable electricity and networks, particularly in Semera and Mekelle, and limited access to Wi-Fi restricted digital usage. Many participants relied on outdated phones and rationed data, curbing access to apps and online learning. Formal digital training was scarce; most learned through trial and error or peer guidance, leaving gaps in advanced skills, online safety, and awareness of available resources. Gender norms imposed domestic responsibilities that limited women's time and autonomy, especially for teachers and SHG members; adolescent girls and CHWs in conservative households faced scrutiny, gatekeeping, and even spousal control over phone use. Negative outcomes were common across groups: scams, misinformation, and online harassment, particularly targeting women and adolescents, were reported; unmoderated content

and addictive social media habits led to physical and mental strain, including eye fatigue and emotional stress. Disabilities introduced further barriers, as many platforms lacked accessible design, and adaptive technology remained expensive. Conflict in Tigray amplified infrastructural disruptions, excluding some teachers and CHWs from digital access and requiring them to revert to basic phones.

Taken together, these findings illustrate both the transformative potential of digital tools and the persistent inequities that shape digital life in Ethiopia after access has been achieved. Adoption, usage, and outcomes vary significantly by location, age, education, occupation, and gender. Therefore, tailored interventions are needed, including investing in affordable infrastructure and devices, expanding inclusive digital training, addressing gender norms and time poverty, supporting people with disabilities, and incorporating community voices into programme design. Only through such context-aware, gender-sensitive solutions can digital technology equitably empower adolescent girls, teachers, women's collectives, and CHWs across Ethiopia.

To foster digital inclusion, Ethiopia should expand access to electricity and affordable internet, while providing free Wi-Fi in public spaces and subsidising smartphones and data plans. Devices and platforms must be accessible for women and people with disabilities. Schools and community programmes require comprehensive digital literacy and online safety training that encompasses both basic skills and how to use Artificial Intelligence (AI) ethically and responsibly. Cultivating peer mentors and digital champions within schools and workplaces and engaging families and communities to support women's participation will help challenge restrictive norms. Programmes should accommodate women's unpaid care responsibilities through flexible delivery and advocate for policies that redistribute these burdens. Investments should focus on mobile-first, offline-capable tools in local languages, promote digital entrepreneurship, and ensure that communities co-create programmes as equal partners.

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1. Introduction

Ethiopia's digital transformation has gained momentum over the past decade, driven by telecom liberalisation, expanding mobile network coverage, and policy change. The digitalisation of several government services, as well as financial systems through mobile banking and mobile money, have been notable catalysts for increased use of mobile phones and the internet. This can be seen through, among other indicators, the growth of SIM card holders, which catapulted from 20.5 million to 69.1 million between 2012 and 2022 (Adam et al. 2024). While this might not seem significant considering the vast population of over 128 million, it is worth noting that Ethiopia has one of the widest urban-rural population ratios, where most rural areas are characterised by a lack of education as well as the infrastructure required for digital technology adoption.

Limited electricity infrastructure, digital literacy, and affordability are the most recurring themes across several studies explaining why the country's internet penetration and mobile adoption remain low. As of early 2024, only 19.4% of the population had internet access – significantly lower than the Sub-Saharan African average of 28% (DataReportal, 2024). Even though there have been notable efforts toward network expansion – there is nearly universal 3G coverage and 33% coverage of 4G networks in urban areas – only 55% of the national population has access to electricity (Adam et al., 2024). Such infrastructure gaps shape access patterns not only in rural areas but even in urban areas, where frequent power outages and weak connectivity limit consistent digital use. Despite nominally low data costs (approximately USD 0.50 per GB), affordability also remains a critical barrier against the backdrop of an average daily income of USD 2.15.

These structural issues intersect with gender-based digital inequalities, which are among the most pronounced in the region. Women – especially those in rural and low-income urban settings – face barriers related to affordability, limited digital literacy, male gatekeeping of devices, and socio-cultural expectations that shape both their time and confidence in digital spaces. Smartphones, which can cost around USD 60 on average, are out of reach for many low-income users, particularly women, who represent the majority of the population who earn a minimum income (Adam et al. 2024). According to Research ICT Africa's (RIA's) quantitative After Access survey (Adam et al. 2024), only 6% of Ethiopian women own a mobile phone, compared to 33% of men, and many rely on outdated, shared, or borrowed devices. Overall, Ethiopia has a 52% gender gap in digital access, while the rural-urban gap reaches 167%.

Furthermore, even after gaining access, gendered risks and digital harms persist; women report higher exposure to online harassment, cyberbullying, and safety concerns, all of which limit their ability to participate fully and safely in digital life (CIR, 2024).

This qualitative study on the gendered use of digital technology in Ethiopia is therefore conducted against a contextual backdrop where, on the one hand, there is rapid growth in access and adoption, but, on the other, there are barriers that not only limit access but also introduce post-access risks. The findings in this report are drawn from in-depth interviews and focus group discussions, both of which helped to anchor each other and allow for a nuanced exploration of the respective experiences.

Organised by population group, each section includes brief participant profiles and a description of context, as well as an account of everyday use of digital technologies, positive outcomes of this use (along with enabling factors and barriers), negative outcomes of this use and their contributors, and gender-specific outcomes and challenges. Given the unique context of post-conflict recovery in the region of Tigray, specific findings have also been highlighted from the teacher and women's collective populations in Mekelle, where half of the data for those groups was collected.

2. Historical context – 2020 to 2024

Ethiopia started adopting telecom technology as early as 1894, when the first telephone line was installed between Addis Ababa and Harar. Over the years, the sector has evolved under different regimes while remaining under the tight grip of a government monopoly, which stifled its capacity to keep pace with the rapidly increasing population and demand. Ethiopia's historical trajectory of digital transformation reflects a landscape in its early stages before 2020, characterised by limited private sector digital services and a few government-led digitalisation initiatives (FDRE, 2020).

In the late 1990s, Ethiopia adopted mobile phone and internet technologies, which were initially accessible to only a few. The 2G mobile data network became available in 2007, followed by broadband internet in 2008, which was only available for offices and businesses. By the early 2010s, Ethiopia began expanding its mobile and internet infrastructure, gradually increasing accessibility. The introduction of 3G nationwide in 2011 and 4G in Addis Ababa marked significant milestones in connectivity (Wei, 2017). Over the next decade, mobile network expansion accelerated, with SIM card holders growing from 20.5 million in 2012 to 69.1 million by 2022. Despite this progress, internet penetration remained limited compared to regional peers, and broadband access continued to lag behind mobile adoption (Adam et al., 2024).

In 2019, Ethiopia opened the telecom sector to foreign companies to facilitate network expansion and promote competition, breaking a long-standing government monopoly that had existed for decades (Telecom Review Africa, 2024). This welcomed East Africa's telecom and mobile money operator Safaricom into the country, making it a catalyst for price and service innovation that prioritised customer retention and recruitment. Safaricom officially launched its network in Ethiopia in 2022. Its entrance introduced a new wave of price and service innovation, increasing competition in mobile and digital financial services. Government-led efforts further played a crucial role in shaping Ethiopia's digital evolution. The Ministry of Innovation and Technology spearheaded initiatives to modernise digital infrastructure, including upgrading WoredaNet and expanding bandwidth capacity. The Ministry of Transportation introduced digital fleet management, while the Ethiopian Investment Commission digitalised its licensing and records management processes. The Ministry of Peace explored Digital ID implementation and the National Bank of Ethiopia (NBE) advanced electronic payment systems.

In October 2024, the Ethiopian government took an even bigger leap, with Ethio Telecom offering its first one million shares to the public. This milestone is part of the government's ongoing economic reform, which is expected to foster a sense of ownership among citizens and attract foreign investment.

Despite these advancements, Ethiopia's digital readiness before 2020 faced significant infrastructural and systemic challenges. Network coverage gaps, affordability issues, and service quality constraints continued

to limit access for citizens, businesses, and government institutions. A strong digital economy requires basic infrastructure, such as electricity and core connectivity, which needs substantial improvements. Beyond physical infrastructure, the country's digital ecosystem requires the development of enabling systems that facilitate interactions between government, private enterprises, and the public. Strengthening this ecosystem also requires better access to capital investment, human capital development, and regulatory clarity.

Challenges beyond technological availability also persist. Socio-economic factors such as income disparities, education gaps, and digital literacy continue to shape who has access to digital services and how they are used. Nonetheless, with a rapidly expanding number of digital services, including mobile banking, government e-services, and fintech solutions, Ethiopia holds promising prospects for sustained digital growth in the years ahead.

3. Literature review

3.1. Infrastructure and technology availability

Ethiopia has experienced sustained infrastructural development in the telecommunications sector, achieving nearly 100% nationwide mobile network and 3G internet coverage. This rapid expansion has been primarily driven by the liberalisation of the telecom sector, which introduced private actors, fostering price competition and network growth. Furthermore, integrating digitally facilitated services, such as mobile banking and mobile money, has increased mobile subscriptions. By 2011, Ethiopia had upgraded its mobile network to 3G nationwide and introduced 4G in Addis Ababa (Wei, 2017). Currently, while 3G coverage approaches full national penetration, 4G remains limited, covering only 33% of urban areas. Despite the availability of fixed broadband services since 2011, subscriptions remain the lowest among internet service types, with penetration rates below 1% (Adam et al., 2024).

The expansion of mobile networks has been a key driver of this transformation, the surge in the number of SIM cards in circulation reflecting a significant increase in mobile connectivity. However, despite this growth, internet penetration has continued to lag behind regional counterparts, expanding at an annual rate of 45%. By 2017, mobile subscriptions had reached 60%, yet only 41% were active. Active mobile broadband subscriptions remained at just 7.1%, significantly below the regional average of 24.8% (FDRE, 2020).

Although Ethiopia's mobile network expansion represents notable progress, challenges remain for the country's population of over 128 million. According to DataReportal, despite extensive network coverage, Ethiopia's internet penetration rate at the beginning of 2024 was only 19.4%, significantly lower than the Sub-Saharan African average of 28%. Given that fixed broadband services are largely concentrated in urban areas, a significant proportion of the population that could benefit from internet connectivity remains disconnected.

The same source indicates that access to electricity is another critical infrastructural factor influencing digital access. According to World Bank data, Ethiopia's overall electricity access rate is 55%, with a stark divide between rural and urban areas. As of 2022, only 43% of the rural population, who constitute approximately 80% of the country's total population, had access to electricity, compared to 94% of urban dwellers; however,

even in urban centres, frequent load shedding and blackouts undermine consistent access to digital technology.

The Ethiopian Government has initiated various programmes to bridge the digital divide in response to these disparities. The Digital Ethiopia 2025 strategy underscores the internet's transformative potential and includes initiatives such as the National Backbone Roadmap, which seeks to increase bandwidth capacity. Additionally, regulatory reforms led by the Ethiopian Communications Authority (ECA) aim to enhance competition and improve service delivery in the telecommunications sector. A key component of these interventions is establishing a universal service fund, mandated by the Communications Service Proclamation (No. 1148/2019), which requires the ECA to set universal access targets to ensure equitable digital inclusion (FDRE, 2020).

Research indicates that barriers to digital adoption extend beyond infrastructure and availability, necessitating systemic and long-term interventions to close the digital divide effectively (Adam et al., 2024; Warner et al., 2023; Asrat et al., 2024). As a result, individuals and communities experience the digital divide in varying ways depending on their socio-economic positioning. This suggests that mere infrastructural connectivity does not automatically translate to widespread usage and meaningful engagement. With over 80% of Ethiopia's population residing in rural areas – where literacy rates, electricity access, and economic development remain limited – most individuals cannot fully afford to engage with digital technologies despite network availability.

Efforts to enhance digital literacy have also been emphasised as a strategy to expand internet adoption among underserved populations. Community-driven digital literacy programmes are particularly needed for marginalised groups, including rural communities, women, youth, people with disabilities, and displaced persons. Additionally, expanding public access to broadband services remains a priority, with proposals to connect government institutions – particularly schools – and establish public Wi-Fi access points to facilitate e-government services (Adam et al., 2024). Regulatory support will also be essential in driving infrastructure expansion and fostering greater market participation, with the ECA playing a central role in advancing these reforms. Further policy measures, such as subsidising home internet access for low-income households and expanding broadband infrastructure to underserved regions, have been proposed to enhance equitable digital access.

3.2. Affordability and accessibility

The issue of affordability and accessibility must be examined through the intersecting factors of income levels, infrastructural accessibility, and the literacy required for meaningful digital engagement. While the availability of digital services has expanded in Ethiopia, significant barriers related to cost, income disparity, and technical skills continue to limit digital participation.

Ethiopia remains one of the most expensive countries globally for mobile data, with 1 GB of monthly mobile data priced at USD 51 in purchasing power parity. This cost is significantly higher than in Rwanda (USD 25), Ghana and Nigeria (USD 18), and Kenya (USD 8). The price of 1GB of data in Ethiopia accounts for 9.65% of the monthly Gross National Income (GNI), far exceeding the International Telecommunication Union (ITU) benchmark recommendation of 2% (FDRE, 2020). Furthermore, smartphone affordability presents a major

barrier to internet uptake, as smart devices in Sub-Saharan Africa cost approximately 25% of a person's monthly per capita income. While data costs impact sustained usage, the prohibitive price of smart devices remains the primary obstacle to initial internet access (Gillwald & Partridge, 2024).

Taxation on smartphones, combined with high vendor profit margins, has rendered these devices largely inaccessible to vast segments of the population. With an average smartphone costing USD 60, a significant proportion of Ethiopians – particularly the quarter of the population earning less than USD 2.15 per day – are effectively excluded from digital participation.

Beyond affordability, digital access requires technical capability, whether for online work, digital communication or e-learning. As Asrat et al. (2024) highlight, adequate digital literacy, skills, and awareness are crucial for maximising the benefits of digital technology. Thus, even when individuals can afford devices and internet subscriptions, low literacy and limited awareness often undermine their ability to navigate digital platforms effectively.

Acknowledging these challenges, mobile network operators (MNOs) have introduced various measures to improve accessibility and affordability. In 2019, Ethio Telecom reduced mobile service tariffs by approximately 40%, followed by further reductions of up to 45% after the market entry of Safaricom Ethiopia. As a new competitor, Safaricom has leveraged advanced network technologies to enhance market competition. Additionally, targeted pricing strategies have been introduced, such as Ethio Telecom's special student discount packages, which allow students to purchase internet subscriptions for ETB 150 via the Telebirr mobile payment system upon verification of their student ID (Asrat et al., 2024).

Infrastructure-sharing initiatives have been proposed to reduce operational costs for service providers and to improve affordability and service quality, ultimately leading to lower consumer prices and increased investment in network expansion. Moreover, the adoption of universal service targets seeks to establish a structured roadmap for extending connectivity to remote and underserved areas (FDRE, 2020). Collaborative efforts between MNOs, local businesses, community centres, and government agencies have also been encouraged to expand Wi-Fi hotspot availability, particularly in areas with limited broadband infrastructure.

3.3. Gender gaps in digital access and usage

Despite the growing body of research on digital technologies globally, data on women's digital engagement remains scarce due to the lack of disaggregated analyses in most studies (RIA, 2022).

Research indicates that multiple factors, including literacy levels, income status, geographic location, and socio-cultural norms, shape the digital divide. These disparities become even more pronounced when considering the intersection of different inequalities. Women's exclusion from digital technologies is deeply embedded in the broader social, cultural, political, and economic inequalities that disproportionately affect them. Moreover, the gendered digital divide is not simply a binary issue between men and women but varies within gender groups.

Women and rural populations in Ethiopia continue to face substantial marginalisation despite nearly universal 3G broadband coverage (Warner et al., 2023; Adam et al., 2024; Gillwald & Partridge, 2024). According

to RIA's 2022 After Access survey, Ethiopia exhibits a 52% overall gender gap in digital access, while the gap between urban and rural areas reaches 167%.

While the country's gendered digital divide reflects global trends, it is further shaped by unique socio-cultural and economic factors (Adam et al., 2024). One of the most pronounced disparities is observed among rural women, whose access to digital technologies is constrained by structural and socio-cultural barriers. Rural women face systemic challenges, including limited infrastructural access, lower affordability, and lower literacy rates, placing them at a greater disadvantage compared to both men and urban women. Additionally, socio-cultural norms – more rigid in rural areas than in urban centres – further exacerbate digital exclusion.

Warner, et al. (2023) indicate that in Ethiopia only 6% of women own mobile phones compared to 33% of men. Shared mobile phone ownership between spouses is uncommon, with only 10% of households reporting joint ownership. Furthermore, one-third of married women report neither owning nor having access to a mobile phone, a rate twice as high as that reported by married men. Studies also show that married women's access to mobile phones in rural areas is often restricted by their spouses, compounding the already low mobile ownership rate caused by awareness and income limitations (Warner et al., 2023).

After gaining access, gender disparities persist in digital usage patterns. Women are more likely to use the internet for social interactions and entertainment than for education or work-related activities. This pattern is closely tied to broader structural inequalities, including disparities in education and digital awareness. Conversely, mobile ownership and access are strongly correlated with access to information in key sectors such as education, health, agriculture, and finance. Rural women with greater access to mobile phones tend to be more engaged in agricultural decision-making, highlighting the positive impact of digital inclusion on livelihoods and community participation.

According to Adam et al. (2024) literacy and digital awareness gaps remain a major constraint, with 25% of Ethiopians unaware of the internet's existence and 30% lacking the necessary skills to use it effectively. These gaps disproportionately impact women, limiting their ability to engage with digital platforms fully. Education levels are a critical determinant of digital inclusion, with internet access rates increasing in direct correlation with higher educational attainment. While women's lower educational attainment reduces formal-sector employment and restricts economic mobility, persistently low levels of digital literacy limit how they can benefit from digital technologies. Low levels of digital literacy in turn reinforce broader educational inequalities, restricting women's capacity to leverage digital technologies for economic and personal development. Even when access is achieved, more than 90% of internet users report feeling constrained in their ability to use digital services fully, reflecting deeper structural inequalities beyond just connectivity (Adam et al., 2024).

Equally important is women's heightened exposure to online harassment, cyberbullying, targeted threats, and broader vulnerabilities related to digital safety. Studies by the Centre for Information Resilience (CIR, 2024a; CIR, 2024b) highlight the prevalence of gendered online abuse in Ethiopia, where women frequently face insults, harassment, and threats severe enough to drive their partial or complete withdrawal from both digital and physical spaces. Beyond immediate exclusion, such forms of technology-facilitated gender-based violence have profound psychological consequences, including fear, anxiety, and long-term mental health repercussions. Moreover, these experiences are not solely gendered but are compounded by intersecting

identity markers such as ethnicity and religion, further marginalising affected individuals. Addressing these post-access challenges is essential to ensuring that digital inclusion is meaningful, protective, and empowering rather than exposing women to new forms of harm.

These gendered disparities require targeted investments in digital literacy, education, and policy interventions to improve affordability, access, and infrastructure. Community-driven digital literacy programmes are crucial for marginalised groups such as women and rural populations. More broadly, investments in human and economic development are necessary to overcome what RIA refers to as the digital inequality paradox, ensuring that access to digital technologies translates into meaningful engagement and opportunities. From a policy perspective, interventions must address literacy, affordability, and infrastructure constraints to facilitate increased mobile phone ownership and internet access for both men and women. Sustainable strategies that integrate digital inclusion into broader development initiatives will be essential in closing the gendered digital divide and fostering equitable participation in the digital economy (Asrat et al., 2024).

3.4. Gendered dimensions of digital labour

The Digital Ethiopia 2025 strategy identifies platform-based work as a priority sector for economic development, viewing it as a strategic tool for integrating women, individuals with limited access to education, and informal sector workers into the digital economy. Initiatives such as Mesirat have emerged to promote women's participation in the gig economy. Mesirat, a local initiative founded in 2023, aims to equip one million youth for digital gig work, with 80% of its target beneficiaries being women and the remaining 20% designated for disadvantaged youth.

Although digital labour is still in its early stages in Ethiopia, it has witnessed sustained growth in recent years, with a notable number of young people turning to online gig work. This expansion has been facilitated by increasing internet accessibility, government policies supporting digital labour, the emergence of locally founded gig platforms, and initiatives aimed at strengthening gig work participation (Cepheus, 2020).

However, comprehensive studies on platform work in Ethiopia makes it difficult to ascertain the exact number of gig workers. Women are likely to be significantly underrepresented in this sector as they continue to face multiple barriers linked to the digital divide, including limited access to education, inadequate digital literacy, and financial constraints. While these challenges are primarily demand-side factors, the high cost of smartphones remains a substantial obstacle, with 84% of Ethiopians unable to afford one, disproportionately affecting women, particularly those in rural and low-income communities.

Research from similar contexts, including findings from Caribou Digital (2023), suggests that women gig workers across the region face common challenges. Although many female online platform workers report that digital labour offers flexibility and greater access to employment, the broader digital labour ecosystem often reproduces pre-existing gender disparities in the labour market. These include wage gaps, gender-based discrimination, and risks of harassment – both online and offline – particularly in male-dominated sectors.

One of the most striking gender-specific challenges women face when engaging in digital labour is the burden of unpaid domestic and care work. Due to the nature of online platform work, which is often home-based, many women struggle to balance professional responsibilities with household duties. Even when digital labour is performed outside the home, flexibility for women frequently translates into using available time for unpaid domestic chores, reinforcing the double burden of paid and unpaid labour.

Despite these challenges, research suggests that many digital workers, including women in developing countries, express overall satisfaction with the flexibility, independence, and improved income potential that online work offers compared to traditional employment opportunities (Heeks, 2017; Caribou Digital, 2023; Ahmed et al., 2021). To enhance women's participation in the digital economy, targeted strategies must address key barriers, such as illiteracy, affordability constraints, and access to essential services like electricity. Providing affordable mobile phones and fostering an enabling environment for women's digital inclusion through coordinated stakeholder efforts are critical steps in closing the digital divide. Education must also be central to digital access strategies, ensuring that women and marginalised communities benefit from ongoing digital expansion initiatives. Investing in community-driven digital literacy programmes will equip women with the skills needed to engage in the digital workforce. Furthermore, policies aimed at improving the affordability and quality of digital access must consider their impact on women and other marginalised groups to ensure inclusive and equitable outcomes (Gillwald & Partridge, 2024).

Given the challenges, governments, initiatives, and regulatory bodies must establish accountability mechanisms and minimum standards to protect women in digital labour markets. The Digital Ethiopia 2025 strategy and Mesirat initiative emphasise ensuring dignified working conditions and fair compensation for online workers. However, these efforts remain in progress, and their long-term impact on women's participation in the digital labour force has yet to be fully realised.

3.5. Gender inclusion in digital policies

Although Ethiopia has witnessed sustained progress in women's rights – particularly in areas such as family law, reproductive health and rights, education, early marriage prevention, and political participation – a significant gap remains that necessitates concerted efforts from all sectors and stakeholders. According to the 2021 Global Gender Gap Report (GGGR), Ethiopia's gender index has fluctuated between 0.71 and 0.69, primarily due to the shifting status of women's political participation, representation, and economic empowerment. In 2021, Ethiopia ranked 97th out of 156 countries on the gender index. Furthermore, the war in northern Ethiopia, which lasted from 2020 to 2022, caused catastrophic destruction to critical institutions, including schools and hospitals, disproportionately affecting women and girls. Women are, as a consequence, disadvantaged with respect to their engagement in the digital economy.

Ethiopia's digital transformation strategy is expected to align with key national and international commitments, including the Homegrown Economic Reform Agenda, the Sustainable Development Goals (SDGs), and the African Union's Continental Digital Strategy. One of the United Nation's SDG targets explicitly promotes ICTs to enhance women's empowerment, recognising mobile phone ownership as a key indicator of progress toward gender equality (Warner, et al., 2023).

Various policy initiatives and regulatory frameworks guide Ethiopia's digital transformation to promote digital inclusion and economic development. The government's approach to digital policy focuses on leveraging technology for social and economic progress, job creation, and improved service delivery (Adam et al., 2024). Several national digital initiatives have been introduced to enhance financial accessibility, expand mobile payment applications, and develop information-sharing platforms. Ethiopia's rural digital strategy also seeks to promote agricultural digital platforms and support agri-tech entrepreneurship through targeted incentives.

However Ethiopia's technology sector has historically been governed by blanket proclamations, regulations, and directives that align with overarching government agendas but do not adequately consider the multi-faceted and intersectional nature of both the general and gendered digital divide (Yilma and Abraha, 2015). Despite the importance of gender-responsive policy interventions, many policy recommendations, projects, and research methodologies remain gender-blind (Warner et al., 2023; Ahmed et al., 2021). While policies aim to lay the groundwork for inclusive technological advancement and meaningful engagement through improved infrastructure and basic women's rights, they only acknowledge the digital gender divide without proposing concrete interventions. Furthermore, policies often group diverse, vulnerable populations – including women, persons with disabilities, and youth – into broad categories, failing to recognise the complexity of women's challenges, which intersect with multiple social and economic inequalities.

For example, the Growth and Transformation Plan (GTP) I and II, covering the periods 2009/10–2014/15 and 2015/16–2019/20, were primarily focused on advancing infrastructure and technology. These plans aimed to expand mobile network capacity, increase the number of mobile and fixed-line subscribers, digitalise government services, and enable the private sector to utilise IT-enabled services. Additionally, the concurrent standalone ICT policies, namely the National ICT Policy 2009 and ICT Policy 2016, elaborated on the priority areas outlined in GTP I and II, emphasising sector-wide development. While these policies acknowledged the need for capacity building and inclusion in ICT-enabled systems such as education, healthcare, and employment, their approach to ensuring women's inclusion remained largely superficial.

The most recent policy, Digital Ethiopia 2025, builds upon earlier policies and national strategies, shifting toward a sector-specific approach integrating digital technologies into economic development. As part of the broader Homegrown Economic Reform Agenda, the policy prioritises agriculture, manufacturing, IT-enabled services (such as Business Process Outsourcing and platform work), and tourism. Although Digital Ethiopia 2025 acknowledges cultural and systemic barriers that women face in some industries, it does not comprehensively explore sector-specific gendered challenges.

Ethiopia's digital transformation is in its early stages, requiring significant infrastructural improvements and regulatory reforms to enhance digital readiness. Expanding network infrastructure, establishing enabling systems, and fostering digital interactions among the government, private sector, and citizens are essential for progress. Additionally, access to capital investment, skilled human resources, and a dynamic regulatory framework will be crucial for advancing the country's digital ambitions. However, the country continues to face critical regulatory and governance challenges, including a limited understanding of the ICT sector among policymakers, outdated regulatory approaches that fail to keep pace with the fast-changing digital landscape, and rigid public procurement rules that do not accommodate innovative technology solutions. Moreover, the

absence of a comprehensive data-sharing policy reduces efficiency in digital governance and innovation (FDRE, 2020). A significant disconnect also exists between policy design and implementation, leading to unintended consequences. Poor policy coordination and a lack of engagement with key stakeholders further discourage investment and limit the potential for innovation in the digital sector.

Addressing these challenges requires a more inclusive and gender-sensitive approach to digital policymaking. Ethiopia must develop targeted strategies that explicitly address gender disparities in mobile phone ownership, digital literacy, and access to financial technologies. Strengthening regulatory frameworks to support infrastructure expansion, digital entrepreneurship, and data governance will be essential in bridging the gender digital divide and ensuring that Ethiopia's digital transformation benefits all citizens equitably.

3.6. Conclusion

This literature review has explored the intersection of gender and digital technology in Ethiopia, examining the historical evolution of digital infrastructure, persistent disparities in access, and the barriers women face in utilising digital tools and platforms. While Ethiopia has made significant strides in expanding mobile networks and digital services and implementing national policy initiatives, deeply entrenched gendered barriers hinder women's full participation in the digital economy. Structural inequalities, affordability constraints, digital literacy gaps, and socio-cultural norms remain key determinants of women's exclusion from digital opportunities, reinforcing broader patterns of economic and social marginalisation.

A critical finding is that while national digital policies, including Digital Ethiopia 2025, acknowledge gender disparities, they lack targeted interventions tailored to women's specific needs. The absence of gender-disaggregated data and the failure to integrate intersectional perspectives into policy frameworks further weaken efforts to bridge the digital gender divide. Moreover, digital safety and security challenges, including online harassment and cyberbullying, present significant risks for women, discouraging their engagement in online spaces, digital labour markets, and entrepreneurial activities.

Despite these challenges, emerging opportunities provide avenues for fostering gender-inclusive digital development. Advocacy efforts, capacity-building initiatives, and gender-responsive policy reforms offer tangible pathways for progress. Strengthening collaboration between civil society organisations, public-private partnerships, and international frameworks will be instrumental in advancing digital inclusion and ensuring that women benefit equitably from Ethiopia's digital transformation. Addressing gender-specific barriers will require more robust policy implementation, expanded digital literacy programmes, and reinforced protections for women in digital spaces. By adopting a more inclusive approach to digital development, Ethiopia can create an enabling environment where women can fully participate in and benefit from the opportunities presented by digital technology.

4. Methodology

4.1. Research design

This study on gender and technology in Ethiopia is one of four conducted by RIA, the other countries being Ghana, Nigeria and Uganda. It forms part of RIA's 2022 After Access survey in seven Sub-Saharan African countries which aimed to build an evidence base of demand-side data for context-specific policy and regulatory interventions. The study examines the usage of digital technologies among women in Ethiopia to organically understand technology adoption trends, outcomes, challenges, and opportunities in their respective contexts. It further seeks to explore how these localised experiences relate to global and regional trends. As such, the study set out to answer the following overarching research questions:

- Are women using digital technologies in their livelihoods?
- What is their user experience?
- What outcomes have they experienced? (positive, none, negative)
- What are the facilitators of positive outcomes?
- What are the barriers to positive outcomes?
- What are the causes of negative outcomes? and
- Under what conditions do outcomes occur?

The study focused on four distinct population groups across the four countries – women's collectives, teachers, adolescents, and community health workers (CHWs) – allowing for a nuanced and intersectional exploration of women's experiences shaped by professional roles, age, and community affiliation.

4.2. Population group overview

Adolescent girls aged 18 to 19 were recruited from Addis Ababa and Semera. Participants included both students and young women engaged in informal or domestic work, offering a range of perspectives on everyday digital practices. Their accounts reflected different exposure levels to technology, influenced by location, school type, (dis)ability, and household responsibilities. A total of 40 in-depth interviews were conducted – 20 in each city – along with one focus group discussion in each location, creating space for both personal narratives and peer reflections.

Female teachers were selected from Addis Ababa and Mekelle, representing a wide range of teaching experiences from secondary schools to tertiary institutions. This group enabled a deeper understanding of how professional background, age, and institutional environment shape digital engagement. Teachers shared insights not only into their own use of technology in and outside the classroom, but also into broader shifts in digital culture across generations. The sample included 40 in-depth interviews – 20 in each city – and two focus group discussions, one per site.

CHWs participated from both Semera and Hawassa, with a mix of rural extension workers and urban-based health professionals. This group offered a layered understanding of how digital technologies are used for both

service delivery and personal purposes in public health contexts. The diversity in their roles – ranging from home visits to clinic-based tasks – highlighted how access, workload, and infrastructure influence usage patterns. As with the other groups, 34 in-depth interviews were conducted across the two cities, supplemented by one focus group discussion in each.

Women's collective members were engaged in both Mekelle and Hawassa, capturing two distinct profiles. In Mekelle, participants were primarily younger women involved in collective advocacy for women's rights, using digital platforms as their main mode of communication, co-ordination, and activism. In contrast, the Hawassa participants were mostly micro-businesswomen, many of whom had limited formal education and used digital tools for financial transactions, marketing, and informal support networks. The study conducted 32 in-depth interviews – 20 in Mekelle and 12 in Hawassa – alongside one focus group discussion in each city. These conversations revealed how collective structures, age, and education intersect with access and usage practices.

4.3. Sampling sites

As the study is mainly focused on technology use after access is achieved, the sampling sites for Ethiopia were selected based on factors including network coverage. Moreover, the socio-cultural composition of the population and current political contexts were considered. Accordingly, the four cities across four different regions selected were:

1. **Addis Ababa:** As the capital and a digital culture trendsetter, Addis Ababa has a high number of internet users and widespread access to smart devices. With better infrastructural access compared to other cities, Addis Ababa offers a compelling opportunity to explore the nuances of after-access digital technology usage. In this site, adolescents were the selected as a population group to understand everyday usage patterns and associated outcomes among a younger generation that has grown up – and continues to grow up – in an increasingly digital environment. In contrast, teachers across different institutions were included to generate insights through generational comparisons between themselves and adolescents, including differences in everyday digital engagement.
1. **Hawassa:** Located approximately 275 km from Addis Ababa, Hawassa is a rapidly growing urban centre with numerous ICT and youth initiatives, making it an appropriate location for the study. Although relatively small, Hawassa is a hub for people from southern regions of the country seeking jobs and access to urban facilities. CHWs serving in public health clinics and members of two women's collectives that fell under a regional self-help group (SHG)¹ were selected to address the main research questions. The dynamic in these groups provides a meaningful contrast between women who have attended higher education and those who have mostly completed only primary or secondary school.
1. **Semera:** Situated around 649 km from Addis Ababa, Semera is located in the northeastern part of the country which is home to a predominantly Muslim, nomadic pastoralist community. This presented a valuable opportunity to diversify the data sources and findings, given the linguistic and cultural diversity of the region. By exploring digital technology usage among adolescent girls and CHWs, a

¹ They are referred to as SHG members in this study.

wealth of data was generated. In addition to generational contrasts, respondents from Semera contributed insights shaped by a distinctive cultural context. CHW participants were also drawn from the nearby town of **Logiya**.

1. **Mekelle:** Located 933 km from Addis Ababa in Tigray in the northernmost region of the country, Mekelle is a region recovering from violent conflict and war that lasted from 2020 to 2022. Exploring digital technology usage patterns and habits in this context offers unique insights into how communities navigate digital life amid post-conflict recovery. Interviews with teachers and women's collectives in Mekelle enriched the findings with perspectives that may not have emerged from the other selected regions.

These sampling cities, along with the strategic pairing of population groups across locations, generated rich findings and contributed to a deeper, more contextual understanding of gendered digital technology use in Ethiopia.

4.4. Sampling strategy

The study employed a purposive, multi-stage sampling strategy to reach participants from the pre-identified population groups across the four cities. Within each group, sites and networks were strategically selected to ensure diversity and accessibility:

- for adolescents in secondary schools and teachers, different school types were included (i.e. public and private), using young university students as data collectors. The data collectors had pre-existing relationships with the schools, facilitating access to participants and enhancing trust;
- adolescents in higher education and those who were not studying were directly approached by data collectors;
- for CHWs, participants were identified through data collectors working in the field and via outreach in public clinics;
- for women's collectives, initial contact was made with collective leaders in the selected cities, who then recommended members to participate; and
- for participants with disabilities, particularly adolescent students and teachers, snowball sampling was employed after establishing an initial contact with a visually impaired teacher.

4.5. Data collection tools and sample size

The findings included in this report are drawn from in-depth interviews and focus group discussions across the four key population groups. While a total of 152 unique participants were interviewed, the focus-group participants were composed of both unique participants (36) and those who had already participated in the in-depth interviews (19). Names used in this report to identify participants are pseudonyms.

Table 1: Sample size distribution across population groups

Tools	Population group	Total
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	Adolescents	Teachers	Community health workers	Women's collectives	
In-depth interview	40	40	40	32	152
Focus group discussion	12	14	15	14	55

4.6. Analytical framework and approach

The analysis was guided by the central research aim of understanding after-access digital technology use, the outcomes of this use, and gendered barriers that prevent this use across four population groups and regional contexts. The in-depth interviews formed the core of the analytical process, offering detailed insight into individual practices and experiences, while the focus group discussions provided complementary perspectives and peer-level reflections.

Drawing from both the data and the patterns emerging across responses, the research team developed a thematic framework – guided by the overarching research questions – to organise analysis around four core areas: Context and population profile; everyday use and practices; lived outcomes of digital technology usage; and gendered outcomes and barriers. This framework allowed for comparative insight within and across population groups, while also accommodating cross-cutting themes and emerging issues.

All transcripts were uploaded into CoLoop, a collaborative platform used for qualitative analysis. Data was coded and synthesised in relation to the thematic framework, with special attention to the nuances across geographies and identities. Observations from field notes were also incorporated to enrich the analysis and ground the findings in lived experience.

Multilingual data collectors were chosen to ensure linguistic diversity to accommodate the different languages participants may speak. As such, while the interviews and focus group discussions were conducted in Amharic in Addis Ababa, Hawassa, and Semera, they were conducted in Tigrigna in Mekelle. All data was then interpreted and directly translated to English during the transcription process.

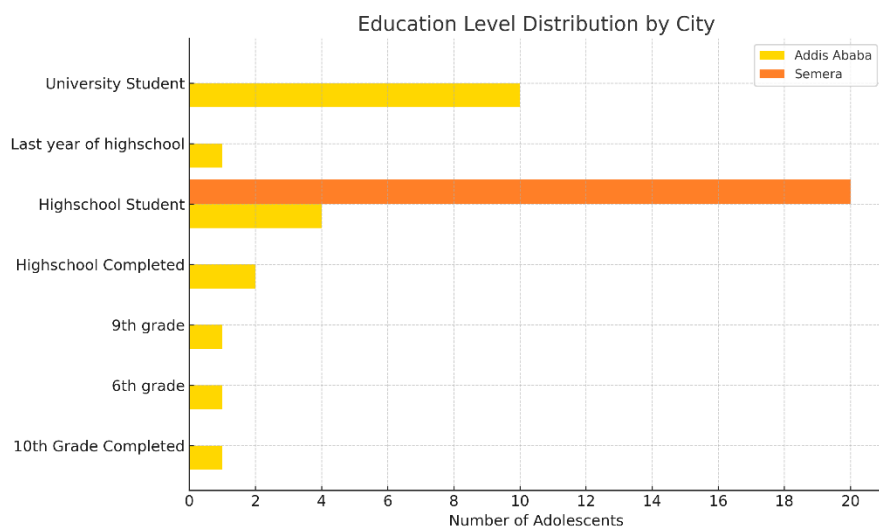
Study findings

5. Adolescent girls

5.1. Adolescents' context and population profile

Adolescent girls in Addis Ababa and Semera share a common youth profile – mostly 18-19 years old, single, and students – yet reflect contextual differences shaped by city size and socio-economic background. While most attended government schools, a few were enrolled in private institutions, and education levels ranged from early school leavers to university students. All lived in urban areas that exposed them to varying levels of digital technology.

Figure 1: Education level distribution by city



In total, 40 adolescent girls participated in the in-depth interviews – 55% were aged 18 and 45% aged 19. All were unmarried and child-free, and 80% were students, with the remainder engaged in informal work such as domestic labour (5%), freelance activities (2.5%), or full-time employment (2.5%). Educational attainment reflected this distribution: 72.5% were enrolled in secondary

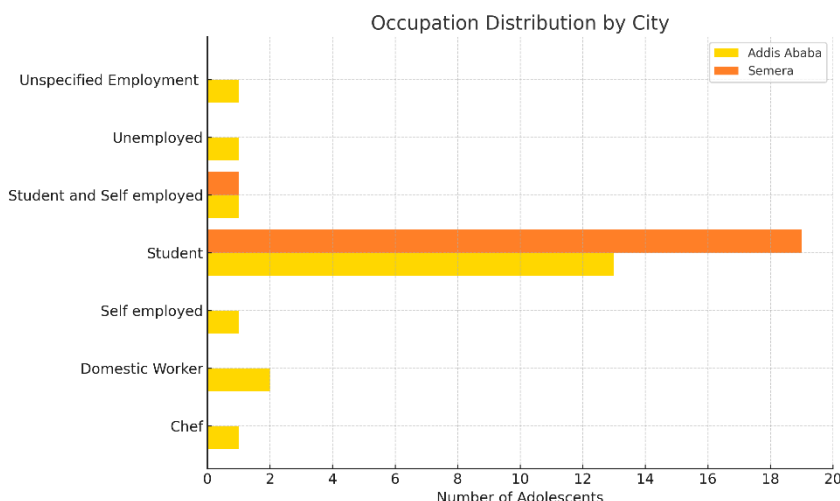
school, 25% had transitioned to university, and only one participant (2.5%) had discontinued formal schooling after primary level. Government institutions were the dominant education provider, accounting for 70% of affiliations, while 15% were linked to private institutions and 15% did not specify. The sample also reflected considerable religious diversity, with 42.5% identifying as Orthodox Christian, 37.5% as Muslim, 10% as Protestant, 7.5% as Christian (unspecified), and 2.5% as Wakefena. This demographic baseline provides a consistent backdrop against which to interpret the lived experiences, technological engagement, and urban influences explored in subsequent sections.

Addis Ababa's adolescents showed higher digital literacy and some entrepreneurial use, while Semera participants emphasised practical, everyday applications. Many acquired their first mobile phones in early adolescence (grades 7–10), driven by school or peer influence. In Addis Ababa, Dagmawit shared her experience of accessing her first phone, stating, *"I started using a phone in Grade 7. In the middle, it was stolen, which made things difficult since it was hard to ask for a new one. I bought another one when I got a job. I bought it from someone, so I did not find it difficult to get. It was accessible and affordable."* Echoing a similar trajectory, Eyarus from Semera said: *"[I got it] when I was in Grade 9. To call with family and friends."* COVID-19 was a turning point in Semera and Addis Ababa, pushing more girls to own

phones for remote learning. Most now use smartphones, though device quality and access vary by income, with lower-income girls relying on shared or handed-down phones.

Figure 2: Occupation distribution by city

Internet access is primarily through mobile data, with Wi-Fi used when available at school or in public spaces. Because of the cost, data use is rationed. Most girls began internet use early, navigating it informally through peer support and self-teaching. As digital natives, they are confident users, grounded in informal learning and early exposure to mobile technologies.



5.2. The digital journey of adolescents

5.2.1. First mobile phones: Timing and motivation

Most adolescent girls in both Addis Ababa and Semera acquired their first mobile phones between grades 7 and 10, typically in their early to mid-teen years. While individual timelines varied, the motivations for getting a phone were strikingly similar across both cities. For many, the device was seen as essential for communication and educational needs. In Semera, where some girls lived apart from their families to attend school, a phone was crucial for staying in touch. One participant noted she needed a phone in Grade 9 *"because I moved from my family for educational purposes, and I also needed it to ask questions related to my studies."* In Addis Ababa, peer influence was more prominent, with several girls describing a desire to fit in besides accessing online learning. One recalled, *"all my friends had mobile phones... so I pleaded with my parents to get me one,"* which finally led to her receiving a device in Grade 10 after nearly two years of asking. A few participants, particularly in Addis Ababa, were gifted phones at a young age. One girl recalled receiving a feature phone at age five or six *"just to get my parents when I was home alone."* On the other end of the spectrum, a handful only obtained their first phone during high school due to financial or familial constraints. The onset of the COVID-19 pandemic emerged as a common turning point, accelerating access to devices for remote learning across both cities.

5.2.2. Acquisition and learning to use the device

In nearly all cases, adolescents received their first phone from family members, most commonly parents or older siblings. In Addis Ababa, girls often inherited used phones, such as a father's old handset, while in Semera, devices were frequently gifted by mothers or sisters for practical reasons like school readiness or safety. A few girls independently purchased their phones, typically older adolescents with income from work, including freelancing. One participant said she *"worked for it and bought it [her]self"* after moving to a different

town for employment. Early devices were often basic feature phones, especially in Semera, where girls commonly started with "button phones" that supported only calls and texts. In contrast, some Addis Ababa participants received smartphones from the outset.

Regardless of the device type, most participants already had prior exposure to mobile phones. Many had used family members' devices and found the transition intuitive. As one girl put it, *"I used to be on my parents' phone before I got my own, so it was nothing new to me."* Learning was largely informal and organic: some girls were taught by siblings or cousins, others figured things out through peer observation or trial and error. In Semera, where fewer girls had personal devices early on, learning from neighbours and friends played a key role in building confidence. Formal digital training was absent, but none of the respondents described major difficulties in learning basic phone functions.

5.2.3. Transition to smartphones and internet use

Over time, nearly all the girls transitioned from feature phones to smartphones. In Addis Ababa, smartphone adoption tended to occur earlier and was often supported by Wi-Fi access at home or school. In Semera, the transition was slower, often delayed by affordability or family hesitations. Nevertheless, by the time of the interviews, nearly all participants in both cities had personal smartphones (a few in Semera still relied on basic phones and had not yet used the internet). The transition was often described as transformative. One girl emphasised the leap in capability: *"The former one does not [do] anything except call. However, the current one enabled me to use digital technology and educational content from Google."* Upgrades were triggered by different circumstances – moving to higher grades, phone theft, or device breakdowns. While many girls continued to receive phones from their families, older adolescents often bought their own replacements. One such girl noted, *"I bought this [Samsung A15] phone myself... I still need my phone to check when I receive money."*

Internet use typically began with the acquisition of a smartphone. Those who started with smartphones or had Wi-Fi at home connected immediately. *"Right after I got the phone, I used the internet. There was a Wi-Fi connection, so I didn't find it difficult,"* said one girl from Addis Ababa. In Semera, some waited weeks or months before going online due to limited access or parental restrictions. A few only went online after switching to more advanced devices, while others described restrictions from family – one girl recalled, *"I did not start [using the internet] immediately; my parents did not allow me until I entered Grade 10."* Despite these differences in timing, most participants were active internet users by the end of their school years. Girls across both regions embraced mobile data and Wi-Fi once they had the infrastructure and device capabilities to do so.

5.2.4. Current digital usage and evolving practices

The adolescents' use of digital technology extended far beyond basic communication. Their smartphones were central to education, social life, and in some cases, economic activity. Academic use was especially prominent. Many girls used their phones to access school materials, search for information on Google, and watch educational videos on YouTube. One participant noted, *"I took the entrance exam last year, and so I needed a phone to watch educational videos because what I learned in school was not enough."* Others mentioned joining Telegram groups for class-related communication and assignments. During the COVID-19

lockdowns, many girls relied heavily on their phones for remote learning – *"Because we could not leave the house, the only way to get information was through the internet,"* said one Addis Ababa student.

Smartphones have also reshaped their social lives. Messaging apps like Telegram, Imo, and Facebook allowed girls to maintain connections and express themselves. As one girl described, *"starting from reading and using TikTok, it has supported me in many ways."* The expansion in phone functionality – from downloading music to browsing the web and using Artificial Intelligence (AI)-powered chatbots like ChatGPT – marked a clear evolution from earlier use. In a few cases, smartphones had become tools for economic engagement. A girl in Addis explained she used her phone *"for social media and digital marketing,"* while another tracked online payments for her freelance work using a mobile banking app. Although these examples were limited, they indicate emerging trends in youth-led digital entrepreneurship. This will be elaborated on in the next section.

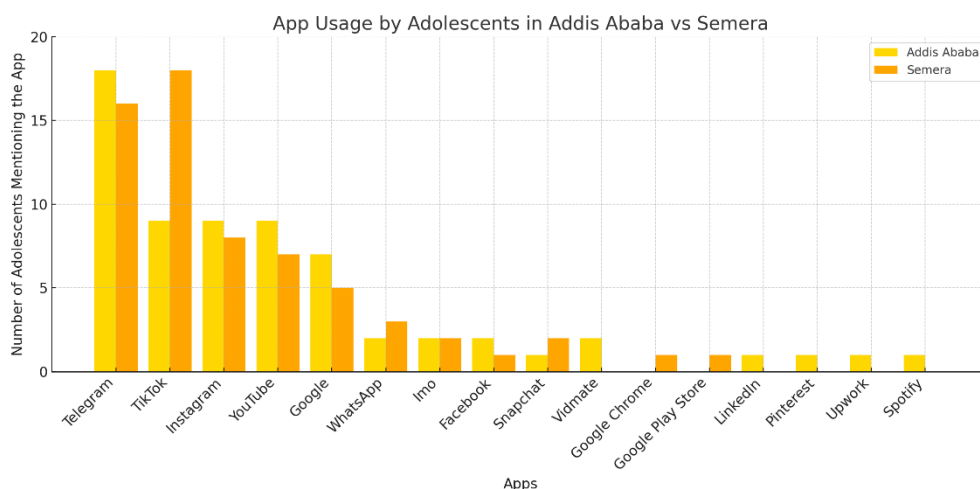
5.3. Everyday use and practices

Digital tools were deeply integrated into the daily routines of adolescent girls in both Addis Ababa and Semera. From morning to night, smartphones were used for communication, education, entertainment, and occasional income-generating activities. Their devices were almost always within reach and served as important tools in their social, academic, and domestic lives.

5.3.1. Frequently used applications

In both Addis Ababa and Semera, adolescent girls reported using a variety of apps daily. The most frequently mentioned platforms were TikTok, Telegram, and YouTube. TikTok was popular for entertainment – many girls used it to watch short, fun videos whenever they have free time, with some admitting it was almost an automatic habit to open TikTok for "refreshment". YouTube was another common choice, valued not only for entertainment (music, movies, and fun videos) but also for learning; several girls mentioned watching educational videos on YouTube to help with school subjects or to learn new skills when they did not understand something in class.

Telegram was extremely prevalent as a communication tool – nearly all the girls used it to stay in touch with friends and family and, importantly, to get updates on school or university classes (via class group chats and channels). In addition, Telegram served as a convenient way to download or share study materials (like PDFs, notes, or even movies) among peers. Besides these top three apps, Instagram was also regularly used by many for social networking – girls used it to follow and chat with friends or see updates and posts. Facebook was used daily by some of the adolescents. However, it was less universal than Instagram or Telegram. A few participants mentioned other apps, reflecting their personal needs or circumstances. For instance, one university student used ChatGPT to help with assignments and summarising notes, and another who worked online referenced LinkedIn (and the Upwork platform) as part of her freelance activities.

Figure 3: App usage by adolescents in Addis Ababa and Semera

Apps like Snapchat (for sharing photos) and Imo (for video calls) were mentioned by individual girls as well, though not by the majority. The smartphone was the main device for accessing all these apps, though a few girls also had access to a laptop or PC, which they used for

specific tasks – for example, watching films on a larger screen or typing up schoolwork. Overall, their daily app repertoire blended social media, messaging, and information sources, with TikTok, Telegram, and YouTube emerging as the most ubiquitous tools across the group.

5.3.2. Purposes of digital technology use

Phones were central to the adolescents' everyday activities and needs — amongst others they were used for communication, emotional support, in household duties, for school-related learning, and economic engagement. Some used phones to look up recipes or caregiving advice, others to coordinate with tutors, employers, or family members. Entertainment remained a major draw, especially for those with consistent access. Leisure, creativity, social validation, and in some cases professional aspiration all intersected in their digital practices.

Communication was the most consistent and widespread daily activity. Adolescents used their phones to call or message family and friends, relying heavily on apps like Telegram and WhatsApp. This daily digital connection was especially important for maintaining ties with relatives living far away. Focus group discussions in both cities affirmed that smartphones were essential tools for social interaction and emotional support.

Education and self-improvement were also key aspects of daily digital engagement. As most participants were students, they frequently searched for school-related information online, downloaded notes and e-books, and participated in group chats to exchange academic content. Both Hanna from Addis Ababa and Ayisha from Semera felt that access to the internet and digital communication had transformed their educational experience as they could find information themselves as opposed to solely relying on outdated textbooks. YouTube was popular for watching tutorial videos, and Google was often used to clarify classroom concepts. Their phones served as important educational supplements, especially where formal instruction fell short. Related to this was the use of phones for assisting with household responsibilities, such as looking up recipes or caregiving tips.

Entertainment and social media occupied a significant portion of their digital time. As mentioned, popular platforms included TikTok, YouTube, Instagram, and Telegram, with varying emphasis. TikTok was used widely for light content and relaxation, YouTube for music and videos (and sometimes learning), and Instagram for browsing and networking. Facebook still featured among some users but was less central compared to other apps. Girls typically switched between multiple apps throughout the day, showing a pattern of multi-platform usage for diverse needs.

In Addis Ababa, adolescents described how livestreaming had become a viable income-generating activity, particularly through platforms such as Bigo Live. As one focus-group participant from Addis Ababa explained, *"People are even making money by going live on different platforms such as Bigo Live and other platforms. You go on live and once people start coming into your live [feed], the platform will calculate your payment per the number of people that join and the amount of time you spend on live."* Echoing this sentiment, another focus-group participant from Semera emphasised the broader impact of such digital platforms, noting, *"It has become a source of jobs for many youths, providing numerous benefits. Many young people have become famous and used this fame to generate income. I suggest continuing to develop in this direction."*

These transformations were also reflected in individual experiences with content creation. In Addis Ababa, Dagmawit described how TikTok offered exposure and creative opportunity, stating, *"Yeab Craft [a TikTok page] makes the photo work accessible to people. Unlike other applications, TikTok has helped make me known."* In Semera, similar reflections emerged about the platform's growing relevance, particularly since the pandemic. *"There have been many positive developments. For example, after COVID, TikTok became popular and many people gained fame, started generating income, and achieved various benefits through the platform,"* one focus-group participant in Semera shared.

Socio-economic and situational factors further influence usage patterns. Girls in school typically had more flexibility and time to use digital tools than those in full-time work. For instance, Mihret, a domestic worker in Addis Ababa with a Grade 6 education, had minimal exposure to digital technologies and did not spend any time on the internet. Her introduction to mobile phone use was limited to viewing images, and she reported no tangible benefits from digital engagement due to her constrained access. Similarly, Tigist, an 18-year-old domestic worker in Addis Ababa who had been using a mobile phone for less than a year, faced significant barriers due to her socio-economic situation. While she acknowledged that digital tools had helped her find work opportunities by enabling communication with brokers, she could not afford better technologies like smartphones and had never used the internet extensively. These examples highlight how employment conditions and economic limitations restrict digital engagement for girls of the same age group, even within urban settings like Addis Ababa.

Emerging entrepreneurial uses of digital platforms were mentioned, especially by Addis's respondents. Some girls reported managing Telegram channels to sell handmade crafts or using LinkedIn to explore freelance opportunities. As mentioned earlier, in Addis Ababa livestreaming had become a viable income-generating activity for some. Focus group discussions echoed this trend, particularly in Addis, where participants shared stories of peers who sold products or offered services like digital marketing through social media. Melat, an adolescent from Addis Ababa, shared how she considered the money she earned online as her main income compared to the full-time day job where she earned too little: *"my entire income is based on*

digital technology. It is not my full-time work, as I have another job during the day, but I learn more from my online work. On Upwork, I focus on logo design and marketing, and sometimes I also try digital marketing." In Semera, although digital income-generating activities were acknowledged more as a possibility than an established practice, some adolescents indicated how some of their peers were engaged in online businesses. For instance, one participant in the focus group discussion shared the following: *"My friend has succeeded by selling clothes online, particularly Abaya dresses, prayer mats, and counters during this holy fasting month – I have seen how profitable this has been for her."*

5.3.3. Daily time spent on devices

The amount of time the girls spent on their phones or online each day varied widely, influenced by their schedules and responsibilities. Some participants – especially those with less strict schedules – reported very high daily usage. A few admitted to being online *"almost all day"*. For example, one university student shared that she was online essentially whenever she was not in class or asleep, totalling around five to seven hours of internet use a day. Another girl working at a shop said that if she had no tasks, she might spend the entire 10-hour workday on her phone to pass the time.

On the other hand, many girls described a more moderate routine of device use – often around two to four hours per day in total. These users often squeezed their screen time into specific periods, such as in the evenings after school or work. For instance, several students mentioned they only really used their phones after classes were done – one high schooler used hers roughly from 5pm to 7:30pm on school days. Another university student noted she might spend half her day (about six hours) on the phone if she was free, but less on days when she needed to study more. There were also girls at the lower end of usage. A couple of participants with limited access or stricter personal habits said they spent as little as 30 minutes to an hour online on a typical day. One girl, who did not have her smartphone until recently, used the internet only occasionally (mainly for homework), sometimes going days without it or just logging on for a quick 10-minute task. In general, students tended to have more constrained time online on weekdays (due to school and homework), whereas those out of school or with flexible schedules could afford longer stretches. Weekends and free days were often when usage spiked – a few girls mentioned that if they had no obligations, they could spend several extra hours casually scrolling through social media or watching videos. It is important to note that many of the girls were aware of their screen time, and some expressed concern about it. For example, one participant reflected that during the COVID-19 quarantine, she once spent nine hours straight online, and since then, she has tried to cut back to a couple of hours per day. Another admitted that she felt "addicted" and would feel depressed or anxious if she had to be without her phone for a long time.

In contrast, others claimed they could control or limit their usage when needed, highlighting that their dependency was partial or situation-based (for instance, only heavily using the phone when there was work or study that required it). Overall, daily device time among the adolescents ranged from minimal to extensive, often correlating with their daily routines – busy students might only have a couple of hours at night. In contrast, those with more idle time or heavy online needs could log five, ten, or even more hours in a day.

5.3.4. Socio-demographic dimensions

The everyday digital practices of adolescent girls in Addis Ababa and Semera were far from uniform. While their lives were increasingly intertwined with mobile technologies, the depth and nature of this engagement varied significantly depending on where they lived, their age, occupation, income level, and literacy. These variations reflected both structural inequalities – such as access to infrastructure and economic resources – and personal and cultural factors that shaped how the girls navigated the digital world.

Geography emerged as a central factor influencing access and app preferences. Adolescents in Addis Ababa benefited from better infrastructure – home or campus Wi-Fi, reliable networks – alongside a more permissive digital culture. They frequently engaged with a diverse range of applications, including Instagram, YouTube, Telegram, LinkedIn, and even newer platforms like ChatGPT. These tools were integrated into their routines for entertainment, learning, networking, and even entrepreneurial efforts. In contrast, girls in Semera often faced limited internet access and higher data costs, which narrowed their digital habits. Their usage typically revolved around practical necessities like school-related Telegram groups, Google searches for assignments, and occasional leisure on TikTok or Facebook. Cultural norms also played a restrictive role in Semera. Some girls reported that their families discouraged or even forbade phone ownership, particularly for girls, suggesting a persistence of gendered expectations about digital behaviour. Such social limitations were less common in Addis, where families often supported their daughters' digital needs by investing in devices and internet access.

Age and education level further shaped how adolescents used digital tools. Older girls, usually in their final years of secondary school or enrolled in university, demonstrated more autonomous and intentional use of technology. They managed their own data plans, utilised laptops for coursework, accessed educational portals, and engaged in digital self-regulation – choosing when to avoid distractions or engage in focused study. They were also more likely to explore digital tools for job searching or professional growth. In contrast, younger girls – particularly those in their mid-teens – were more often subject to parental restrictions, with usage limited to specific times or activities. Their digital lives were centred on social interaction and light entertainment, with platforms like TikTok and mobile games playing a prominent role. That said, many younger girls began using phones more intensively during the COVID-19 pandemic, which served as a key moment of digital immersion. Across both age groups, a common trend was the gradual shift from recreational to more purposeful use as girls matured and gained responsibility over their digital routines.

Occupational status also played a strong role in shaping daily digital routines. For students, devices were mainly used to support academic tasks such as downloading materials, researching topics, and coordinating group assignments. Their screen time was often structured around school schedules, with higher use during evenings or weekends. By contrast, girls engaged in income-generating activities reported more prolonged and practical use of their devices. Those working in service roles, like in photo shops, used phones both for work-related tasks and to pass the time during slow hours. Others, such as freelancers involved in digital marketing or content creation, described using multiple devices for extended periods – sometimes totalling 10–12 hours of digital engagement per day. For these girls, smartphones and PCs were not just accessories but essential tools for earning a livelihood.

Economic condition significantly mediated access and quality of digital engagement. Participants from lower-income households often lacked access to laptops, owned only basic smartphones, and had to ration

expensive mobile data. For some, internet cafés were the only means of going online for schoolwork. Several noted that affording data packages was a continual burden, with small weekly top-ups running out quickly. These constraints limited not just how much they could be online, but what kinds of platforms and services they could realistically use.

In contrast, girls from more affluent households – especially in Addis – reported having stable home Wi-Fi, newer devices, and even support from family members in the telecom sector. These conditions enabled them to explore a broader digital landscape, including platforms for learning, creativity, and income. Economic security translated into smoother and more confident digital practices, while those with limited means had to make calculated decisions about when and how to use the internet.

Literacy levels, both academic and digital, further differentiated users' engagement with technology. Girls with stronger educational backgrounds tended to explore more complex digital tools, combining text-based and video content, reading PDFs, and navigating academic platforms with ease. Some even participated in online freelance platforms or professional social networks. Meanwhile, those with lower literacy or less exposure to digital tools gravitated towards audio-visual content and simpler interfaces. They preferred videos to text and often limited themselves to a few familiar apps like Telegram or YouTube.

In some cases, language also posed a barrier, with girls avoiding English-only content unless translation help was available. As a result, more literate participants and those more proficient in English were often able to derive greater educational and professional benefit from digital tools. In contrast, others used them mainly for communication or recreation until their skills could catch up.

Across these dimensions, one constant emerges: despite differences in access, experience, and confidence, adolescent girls in both Addis Ababa and Semera saw digital technology as increasingly indispensable. Their practices may differ in purpose and intensity, but digital tools played a central role in their communication, learning, income generation, and self-expression. These variations illuminate the many pathways through which girls navigate digital spaces, and the structural, social, and personal factors that shape their digital opportunities.

5.4. Lived outcomes of digital technology usage

5.4.1 Positive outcomes

Adolescent girls in Addis Ababa and Semera described digital technology as transformative, unlocking opportunities that supported their education, social life, self-confidence, and, for some, financial independence.

Educational improvement was one of the most consistent benefits cited. Internet-enabled devices allowed adolescents to fill gaps in their schooling by accessing supplementary learning resources. Many relied on platforms like Google and YouTube to clarify lessons, access e-books, and follow tutorials, especially in subjects where local teaching was limited. This self-directed learning boosted academic performance and confidence. For instance, Bitaniya, an Adolescent from Addis Ababa aspiring to study law, shared how watching online documentaries helped her build knowledge and language skills. Focus group discussions in both cities confirmed these patterns, framing digital access as "levelling the playing field" for girls determined to advance academically.

Adolescent girls in both Addis Ababa and Semera further reported that digital technologies had significantly enhanced their learning experiences. In Addis Ababa, participants often leveraged global platforms and tools for studying – one university freshman noted that without digital access, she *"would not have access to books and other apps like ChatGPT and Google"*, implying she would fall behind in her studies without these tools. Students commonly use YouTube (e.g. Khan Academy channels) and Telegram groups to supplement school learning. A first-year campus student explained that class materials, exam guides, and lecture notes were frequently shared in Telegram groups, which, she said, *"helps me a lot"* when she did not know anyone to ask in person. *"[It] encourages me to read and study more,"* she said. Several Addis respondents mentioned using search engines and online libraries to find information beyond what textbooks provided, with one girl saying she *"used to rely only on books"* but now can *"browse more information"* as needed on her phone – *"Everything in that regard is positive,"* she said. Another student said digital media *"enhanced my educational career"* by letting her obtain *"whatever books and educational-related content"* she needed from the internet. Notably, some urban girls even utilise AI-assisted tools: they described Google and AI apps as study aides that offered quick answers or summaries, helping them confidently complete assignments (albeit with caution about originality). Addis Ababa students credited digital technology with faster communication among peers, quick access to reference materials, and new learning channels that were not available to previous generations.

In Semera, where educational resources can be more limited, digital access proved especially transformative in bridging gaps. Several girls discussed using smartphones to obtain study materials that were scarce locally. One high school girl preparing for exams noted that her phone gave her access to *"many matric exam questions that I would not find in a physical library"*, calling this *"a great advantage"* for her studies. One respondent credited online content with helping her pass a national exam. When her school had no economics teacher in Grade 12, she *"learned online"* using YouTube and other resources and successfully passed the exam as a result. Girls in Semera frequently use Telegram and Facebook groups as well to share educational information with classmates. After getting a smartphone, one rural student found she could finally exchange lecture notes with friends over Telegram and discuss homework outside of class. Another mentioned she downloaded videos and class files sent in group chats, which had positively changed how she studied. Many

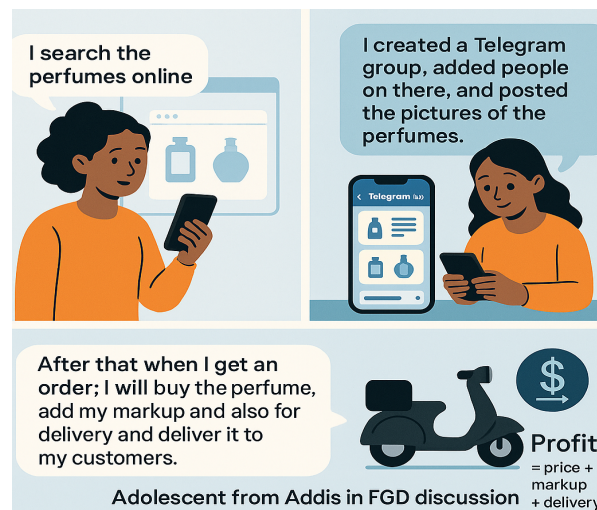


Figure 4: An adolescent from Addis Ababa explains her business process using Telegram

Semera participants indicated that even minimal online access was beneficial – one girl said if she did not understand a lesson in class, she could “*go home and read on my phone*”, using the internet to review and learn the material on her own.

Girls from both regions agreed that the ability to search for information on demand – whether via Google, YouTube, or educational apps – had expanded their knowledge base beyond the classroom. Some also felt that digital tools improved their study efficiency and confidence; for example, a student mentioned that by watching tutorial videos, she could now do homework and “*no longer*” feared making mistakes in her answers. In sum, across urban and rural settings, digital technology had opened new avenues for academic self-improvement: from accessing online textbooks and exam prep materials to joining virtual study groups, the adolescent girls were leveraging technology to transform their educational journeys in overwhelmingly positive ways.

Communication for personal and social reasons was also a commonly shared positive outcome. Digital tools played a major role in strengthening relationships, allowing girls to maintain emotional closeness with distant family and friends. This was especially prominent for those who had moved for school or work. Both the interviews and focus-group discussions emphasised how digital connectivity helped them build and sustain supportive social networks.

The sense of **empowerment and autonomy** that technology enabled was also widely noted. Girls felt more confident and informed with access to online information – whether it was learning a new skill, getting health advice, or expressing themselves creatively. Posting content or participating in online groups allowed them to voice their opinions and showcase their creativity, something particularly meaningful in a context where young women's voices are often marginalised.

This form of expression was not only a means of visibility but also fostered peer support and inspiration. As one focus-group participant from Semera explained: “*For example, digital technology has enabled life experience sharing on platforms like YouTube and TikTok that many youths use. It allows them to support each other and learn from shared experiences. When someone shares their life story, others may relate to it.*” A similar perspective was echoed by a focus group participant in Addis Ababa, who emphasised the role of such platforms in helping youth communicate their skills and find job opportunities. Beyond peer connection, digital spaces were also seen as amplifiers of women's leadership. As another focus-group participant in Addis Ababa reflected: “*We are seeing so many strong and inspiring women who are on social media and who are role models to so many young women and girls. Moreover, digital technology has facilitated such women to come forward.*” Likewise, Kulsuma, a Semera girl, noted: “*The general usage of my digital technology is that it has helped me gain knowledge on different topics, share good content, and facilitate my educational career. It has also allowed me to access daily news through simple searches and connect with many people online, getting to know each other*”. Focus group discussions further highlighted how girls followed inspirational women online or joined girls-only channels that motivated them and built solidarity. These online communities acted as spaces for encouragement, exposure, and personal growth.

Digital technologies had enriched the personal and social lives of the girls by connecting them with people and information that support their well-being. In both Addis Ababa and Semera, the ability to communicate easily with family and friends was the most cited benefit. Several girls explained that having a mobile phone

relieved anxiety about loved ones' safety and whereabouts. Especially for girls in Semera, who might have relatives in distant areas or abroad, phones and social media became lifelines to maintain family ties. Many girls also talked about expanding their social circles online. In Addis Ababa, teens described how social media let them meet new people outside their usual circle, while in Semera, girls who previously had limited social circles found that going online introduced them to *"many people...from around the world"*. Messaging apps made a noticeable difference: a Semera girl recounted that before owning a phone, she could only talk to friends at school, but that through calls and Telegram chats this had changed. *"Now, since I have a mobile phone, I have a wider social life and communication with people,"* she said.

Similarly, social media platforms like Facebook, Instagram, and TikTok also enabled building friendships and broader connections. One respondent shared that she *"got many good friends through social media"* and became acquainted with people outside her hometown through active online engagement. Another remarked that gaining followers *"made me famous"*, giving her a sense of recognition among peers. This broader community exposure had boosted the girls' social confidence and connectedness. These effects were especially prominent in Addis Ababa, where digital media was also seen as a space for creative expression, self-branding, and visibility. In contrast, in Semera, the emphasis remained on overcoming physical separation and connecting with others in meaningful ways.

Digital technology also contributed positively to emotional well-being and personal development. Many participants described the internet as a space to gain life knowledge, learn new skills, and relieve stress. Some learned practical skills such as make-up, cooking, or health routines through YouTube; others accessed motivational content that improved their outlook and self-perception. A few adolescents even mentioned that listening to spiritual messages online had strengthened their faith. Girls said that online content helped them *"change [their] attitude"*, *"improve [their] interaction with people"*, and *"deal with problems in [their] life"*. These personal and emotional transformations were often subtle but meaningful – from gaining confidence and purpose to feeling less isolated or anxious.

Digital tools had also become gateways to new forms of **employment and entrepreneurship**, though this benefit was still emerging and unevenly distributed. The interviews revealed that only a minority of the adolescent girls had started using digital technologies to generate income, and these cases were primarily in Addis Ababa. Among adolescents in Addis Ababa, several girls reported using technology to support side businesses, find freelance gigs, or generate income through content creation. From selling homemade crafts to managing Telegram channels for businesses, girls were exploring how to turn their digital presence into economic opportunity. For some, online income served as a critical supplement to low-paying day jobs, and in a few cases, it even constituted their primary livelihood. These cases pointed to the role of digital access in enabling financial autonomy, particularly when girls were equipped with the necessary skills and support.

In Semera, on the other hand, online income-generating practices were far less common. Most girls were full-time students or not yet in the labour force, and barriers such as device limitations, internet costs, and lower exposure to the internet constrained their ability to pursue digital work. However, many girls expressed interest in exploring these opportunities in the future, especially after observing peers who had succeeded in turning digital tools into a source of income.

The adolescents who did engage in digital economic activities demonstrated how technology can open new earning opportunities for youth. There were three main types of economic activity observed:

Small online businesses – A few Addis-based girls had leveraged social media to launch side businesses. For instance, Yabsira, a 19-year-old adolescent from Addis Ababa, ran a perfume sales venture as her side job, promoting and selling products through digital platforms. She explained that she uses social media (such as a Telegram channel) to advertise her perfumes, allowing "*many people*" to discover and buy her items online. This adolescent entrepreneur did not have a fixed salary – some weeks she "*may sell many perfumes and [other times] may sell few*" – but her work had provided her with an income stream while being a student. Her case illustrates how digital tools enable teens to reach customers beyond their immediate surroundings, essentially creating a micro-scale e-commerce outlet via social networks.

Family-run digital enterprise – One girl worked full-time in a family crafts business that had been transformed by digital technology. Dagmawit, an 18-year-old adolescent from Addis Ababa, and her brother produced custom wood art, and they relied on smartphones and social media to conduct most of their business. "*Our main work is based online*," she explained, noting that customers placed orders by sending photos over Telegram, and the family used TikTok and Instagram pages to showcase their products and attract buyers. This digital approach had dramatically improved their income flow. In the past, when the business depended on walk-in customers, she had to "*wait a month to get paid*," but now, with orders coming in via social media, "*I can earn money anytime I want*," she said. She described it as "*like having my own business*" with newfound freedom and flexibility, especially since the work was done at home with her family. Importantly, she attributed their wider customer reach to digital platforms: without a smartphone and apps like TikTok, "*our work would not be known in many places*," she said, whereas viral posts and online shares had made their products visible to a much larger audience. This example highlights how an adolescent in a family business gained financial independence at a young age through the strategic use of digital media.

Freelancing on global platforms – Perhaps the most striking economic outcome involved an Addis Ababa girl who built a successful part-time freelance career online. Melat, a 19-year-old adolescent, described that her "*entire income [as] based on digital technology*". She worked on the international freelancing platform Upwork to offer services like logo design and marketing strategy. Even though she held another job during the day, she noted that she actually "*earns more from my online work*" than from her offline job. She detailed the earnings model: for example, she could earn around USD 17 per logo design if it was high quality (about UD 5 for simpler ones), and she also took on marketing projects that involved several days of research and planning. The income she generated online was substantial enough that she used it to pay for personal expenses like her gym membership, Wi-Fi bills, transportation, food, and clothing, and still contributed financially to support her family. This young freelancer's experience demonstrates how digital platforms can connect adolescents to global markets and clients, allowing them to monetise their skills beyond local opportunities. She also became a source of inspiration and knowledge-sharing in her community: she enthusiastically told many people how to earn online. Her success – and that of a friend who learned programming and was hired abroad in the tech industry – shows the potential long-term economic upliftment that digital skills and work can provide.

Some also expressed distrust of online money-making opportunities or simply had never given it much thought. For example, Loza, an 18-year-old adolescent from Addis Ababa, said, *"I think that most of them are scams, so I do not believe in them"* when asked about digital income platforms. Indeed, several Addis and Semera participants alike recounted hearing about get-rich-quick schemes circulating on social media. A few had even experimented on a small scale: Blen, an 18-year-old Addis girl, tried an investment app called "Infinity Power" where she paid ETB 500 upfront and got ETB 1 900 back after a month, and two other adolescents from Addis, Hermela and Meseret, mentioned signing up for a referral programme on Telegram (sometimes dubbed "Amazon" by locals) that promised easy money but required an initial fee, which they ultimately decided not to pay. However, these were isolated attempts and often short-lived.

Outside of Addis Ababa, by contrast, very few girls had ventured into digital income generation. In Semera, none of the interviewed girls reported actively earning money online at the time of the study. Most Semera adolescents were full-time students with no side jobs, and they tended to view online earning with scepticism or faced barriers to entry. Common reasons for not pursuing digital income included lack of resources (like not having a good smartphone or reliable internet) and parental discouragement due to fears it would distract from education. *"No [income-generating activity]. Not yet. I am focused on my education,"* Hawa, a 19-year-old Semera girl, admitted. Eyarus, another adolescent from Semera, noted that she did not have the skills and training to utilise digital platforms for income-generation purposes, saying, *"No, I did not try. Nevertheless, for the future, I want to engage after taking the training and insight."*

The overall pattern is that Addis Ababa girls – with better connectivity, exposure, and often more permissive environments – had begun tapping into digital economic opportunities, from social media-based commerce to global freelancing. Meanwhile, Semera girls remained in the early stages of this digital economic transformation. For them, digital technology was still seen mainly as a tool for communication and learning rather than income, though a few had observed others earning online and might be open to it down the line. It is worth noting that even among those not yet earning, there was awareness that social media and online platforms can be sources of income if used effectively – one respondent acknowledged that *"many youths are earning income through online work"* and that digital media *"can also be a source of income through online jobs"* if one has the skills and motivation.

For adolescents with disabilities, **technology can be transformative**. A visually impaired adolescent from Addis Ababa, Feven, described how a smartphone, paired with accessibility tools like screen-reader apps, allowed her to gain greater independence in communication and learning. She was part of a Telegram group called "Technology for Kizishan" where visually impaired users shared tutorials, app reviews, and tips via voice notes. She shared her experience: *"It is different how blind and sighted people use technology, so it is often easier for a blind person to explain. I have seen how to use an application called Install Reader, shared through voice messages in that group [Technology Kizishan]. It helps other blind individuals by explaining how to use it. It also answers questions from other blind people in the group."* Her account highlights how peer-led knowledge exchange not only makes digital tools more accessible but also fosters a sense of community grounded in shared experience. These peer-to-peer networks act as lifelines – offering support, problem-solving, and encouragement in navigating digital tools that sighted peers often take for granted.

5.4.2. Facilitators of positive outcomes

Adolescent girls in both Addis Ababa and Semera identified a range of facilitating factors that enabled them to achieve positive outcomes from using digital technology. These factors spanned supportive social relationships, personal drive, online communities, the necessary infrastructure, and institutional inputs, all within a broader social and cultural context. The following details each set of facilitators, incorporating perspectives from both regions, and noting key differences where relevant.

A strong theme across the interviews was the **crucial role of family and friends** in fostering positive digital experiences. Many girls credited their families with providing the basic means to get online by purchasing devices and covering internet costs. Parents often bought their children smartphones at an early age and continued to pay for Wi-Fi or mobile data packages, ensuring consistent access. *“My family plays the primary role by providing access, buying the devices, and paying for my internet,”* an adolescent from Addis Ababa explained, highlighting that without this material support, she would not have had the chance to explore the digital world. In both Addis Ababa and Semera, even girls from modest backgrounds noted that their parents did what they could – for example, buying prepaid mobile cards or sharing a household phone – so that the girls could connect when needed. In a few cases, adolescents who did not own a personal phone were still able to go online occasionally by borrowing a family member’s device, which they counted as a form of support. Beyond financial help, families provided emotional support and freedom to engage with technology. Several girls emphasised that simply having parents who trust them and do not restrict their device use was a facilitator. Melat, a 19-year-old adolescent from Addis Ababa, described how *“unlike other parents, [my mother] does not question why I am always on my phone... she accepts what I tell her and encourages me to keep going.”* In her view, not being pressured or policed by family created a comfortable environment to learn and try new things online. She mentioned that her father’s *laissez-faire* attitude – believing that *“everyone can make their own decisions in life”* – meant he gave her space to pursue her online interests, which she regarded as *“great support”* in achieving her goals.

Peers were equally influential. Friends often acted as digital mentors and motivators, helping the girls discover new tools and stay on track. Across both regions, girls reported that their friends taught them how to use various apps, shared tips, and even physically showed them features on their phones. *“My friends showed me how different applications work,”* said Feven, another Adolescent from Addis Ababa, explaining that her peers’ greater knowledge helped her become proficient more quickly. Friends also kept each other informed and inspired. In Semera, where formal digital literacy training was scarcer, such peer-to-peer learning was especially important: girls relied on friends to introduce them to educational websites or demonstrate technical skills that they could not learn elsewhere. Encouragement and positive peer pressure from friends further propelled the girls’ digital endeavours. Some had friends who cheered them on to create content or pursue online income. *“My friends encourage me to post on TikTok,”* said Blen, a 19-year-old girl from Addis Ababa, describing how seeing her peers succeed online pushed her to be more active. In a similar vein, some teens mention observing friends earn money via their phones (through activities like digital marketing), which motivated them to start exploring those opportunities. This kind of friendly competition or inspiration created a ripple effect: when one girl found success or a useful digital practice, others in her circle were inspired to follow.

While social support was key, the adolescents' **personal motivation** and mindset emerged as another powerful facilitator. Nearly all the girls expressed a strong inner drive to make the most of digital tools. For many, this started with simple curiosity and eagerness to learn. *"I am very curious to learn about things, so I put myself in the digital world,"* said Betselot, an Addis Ababa adolescent, illustrating how an inherent interest in exploring the internet propelled her forward. Several others echoed that sentiment, describing themselves as "curious" or keen on discovering new things online – a trait that naturally led them to uncover positive uses for technology.

In both Addis Ababa and Semera, girls often had clear personal goals that aligned with their digital activities. Ambition and career aspirations were major motivators, especially among the older adolescents. One young woman from Addis explained that since middle school, she had been fixated on achieving financial independence. This ambition drove her to seek out online work and digital skills-building as a teenager, laying the groundwork for future economic empowerment. Others were motivated by academic and professional dreams; for example, a student who aspired to become a lawyer talked about using the internet to watch law-related videos and true crime documentaries, saying her *"desire to be a lawyer"* directly influenced her to consume educational digital content. Some girls were inspired by creative passions – Fatuma, an 18-year-old from Semera, noted that her love of drawing and painting *"enabled [her] to engage in digital technology usage"* by pushing her to share art videos on TikTok and improve her skills via online tutorials.

Another aspect of personal motivation was the desire for self-improvement and independence. Several participants mentioned that they wanted to develop themselves through technology without always relying on help. For instance, Feven, a girl living with a disability, expressed a strong determination to use her phone *"the way a non-disabled person would"* and to independently do most tasks by herself. Her resolve to overcome challenges through tech was a key factor in her positive outcomes. Similarly, others spoke of self-reliance in learning digital skills (e.g. figuring out apps on their own or through trial and error) and a willingness to invest personal time and effort to reap benefits. In short, the intrinsic motivation of these girls – their curiosity, ambitions, personal interests, and sense of purpose – was a driving force that, alongside external support, enabled them to leverage digital technology in uplifting ways.

Another set of facilitators revolved around the **online communities, platforms, and social networks** that the girls engaged with. Once connected, the adolescents found that the internet itself provided networks of knowledge and encouragement beyond their immediate friends. Online platforms became spaces for learning, sharing, and finding inspiration, effectively expanding the girls' support system to a broader digital community.

Educational and interest-based communities were particularly valuable. Many girls joined or followed online groups, channels, or pages that aligned with their needs. For example, some high schoolers became members of Telegram and Facebook study groups where students share notes, past exam papers, and tips. Examples of group names given were Semera High School Telegram Group, Smart Education, Grade 11 D Social Students, Z Secret for matric prep, High School Educational Support. Others subscribed to YouTube educational channels – often on the recommendation of teachers or peers – to help with difficult subjects (e.g. Khan Academy, Havan Academy and animation-based YouTube tutorials). *"My classmates recommended Khan Academy to me,"* Bitaniya, an adolescent from Addis Ababa, recalled, explaining how discovering that online

learning resource made a big difference in her exam preparation. Teachers in Addis Ababa schools also sometimes pointed students toward helpful Telegram channels or Google Classroom groups for extra learning materials, which the girls eagerly embraced. In Semera, where formal resources can be limited, finding these online communities was even more transformative. By tapping into such networks, girls in both regions were able to access study guides, tutorials, and advice that they might otherwise lack in their local environment. These peer-driven online communities effectively supplemented their education and skills development.

Social networks additionally exposed the girls to role models and mentors – often informally – through content sharing. Several respondents said they looked up to certain personalities or creators they encountered on the internet. *“There are people I come across on the internet who inspire me or become my role models,”* Hermela from Addis Ababa noted, emphasising that seeing successful or positive figures online motivated her to aim higher. This kind of inspiration was an important facilitator, especially for girls who lacked local examples in certain fields. Similarly, the success stories shared on social media served as motivation. Moreover, engaging on mainstream social media platforms like Telegram, Facebook, TikTok, and Instagram created a supportive network effect. The girls described how they and their friends stayed connected online almost constantly, exchanging useful information. Through group chats and channels such as Afriwork, Dhaootaaf Official, Afarino, Red Cross Society Group, and Yeab Craft on TikTok, the adolescents alerted each other about scholarship opportunities, job openings, or simply shared motivational posts. One common practice was using Telegram groups to circulate class materials: *“If a friend in another class gets a handout or notes, she will take a photo and share it with me on Telegram,”* said Meseret, an 18-year-old student from Addis Ababa, *“so I do not miss out and can either print it or copy it.”* This easy sharing of information ensured that even students in resource-constrained schools could get the learning materials they needed. Social networks also provided emotional camaraderie – during stressful exam periods or when learning new digital skills, the girls could reach out to online friends (sometimes peers they had never met in person) who would encourage them and exchange experiences.

Some participants demonstrated creative adaptation of social media tools to overcome barriers. For instance, a few girls mentioned using Telegram not just to chat but as a way of accessing information and knowledge via public channels (e.g. Ethio Freshman Materials, Melody of Myriads, Orthodox Tewahedo Mezmur). One girl shared that she uses Telegram to download movies and other content, which is far more affordable than streaming – a clever workaround to enjoy entertainment and educational videos (e.g. English movies and K-dramas) without straining her budget. Others took advantage of Facebook groups that operated in “free mode” (text-only browsing without data charges) to stay informed when they ran out of data. These adaptive uses of platforms – such as leveraging Telegram bots for free resources or joining zero-rated (cost-free) apps and websites – allowed the adolescents to keep learning and interacting online even under economic constraints. The girls’ ability to find and participate in such online communities and low-cost digital spaces significantly contributed to their positive outcomes, giving them access to collective knowledge and support at the click of a button.

It is also worth noting that the type of online community involvement sometimes differed by region, reflecting the digital ecosystems available. In urban Addis Ababa, some girls were active in more specialised online communities – for example, tech-focused forums like Addis Coder or Brighter Generation or entrepreneurship

networks – owing to their higher exposure and access. In Semera, where internet use was still catching up, the online communities tended to centre around education and social connection, such as the Semera High School Telegram Group, the Red Cross Society Group, Afarino, and spiritual channels. Despite these differences, the fundamental effect was the same: being part of a wider online network empowered the girls with information, mentorship, and a sense of belonging that spurred them to use technology in constructive ways.

The extensive use of Telegram, YouTube, TikTok, and other social platforms by adolescent girls in both Addis Ababa and Semera highlights the growing centrality of digital communities in shaping their educational and personal development journeys. These platforms have become vital spaces for accessing learning materials, discovering job opportunities, engaging with motivational content, and fostering peer connection. From localised school groups in Semera to specialised educational and career-oriented channels in Addis Ababa, these online networks have broadened the girls' access to knowledge, encouragement, and self-expression. In doing so, they not only bridge gaps in formal education and social support but also enable girls to imagine and pursue broader aspirations, empowering them with tools to thrive in increasingly digital societies.

The presence (or improvement) of basic **infrastructure and economic enablers** was another foundational facilitator for positive digital outcomes. Simply put, when the necessary building blocks – reliable internet connectivity, electricity, and affordable devices/data – were in place, the girls could utilise technology far more effectively. Participants' experiences underscored how crucial these enablers were and also revealed disparities between the highly connected urban centre of Addis Ababa and the more infrastructure-challenged Semera region.

Foremost, access to the internet itself was highlighted as a make-or-break factor. Many girls recalled periods when they had little or no connectivity and how that limited them, compared to later on when connectivity improved. Several families in Addis Ababa installed broadband Wi-Fi at home during the COVID-19 pandemic or in recent years, which dramatically expanded the girls' digital opportunities. "I could not even use mobile data before because Wi-Fi was only recently installed in our house," said one girl from Addis, explaining that her family's improved financial standing finally allowed them to get home internet. With Wi-Fi, she suddenly had the freedom to go online for school research, online courses, and creative projects without worrying about running out of mobile credit. Likewise, another student pointed out that having internet access at school or campus was transformative: "*The availability of Wi-Fi on campus makes a big difference. I cannot depend solely on mobile data for everything,*" she noted. "*It simplifies so many tasks and reduces the difficulties I would face if [Wi-Fi] were not there.*" In Semera, where fewer households have broadband, girls often relied on mobile networks – but improvements there (such as expansion of 3G/4G coverage) and the presence of internet cafés or community centres with connectivity were mentioned as helpful. One respondent from Semera mentioned that just the basic availability of a mobile network signal and a charging spot allowed her to participate in online learning that would otherwise be impossible in her village. The rollout of infrastructure – from home Wi-Fi and school computer labs to telecom network upgrades – directly enabled these adolescents to access digital tools and opportunities.

Device ownership and maintenance were another vital enabler under this theme. Most of the positive outcomes hinged on the girls having a functional smartphone or computer to use. As noted in the family

support section, many parents made sacrifices to buy their daughters a phone or a tablet. In Addis Ababa, it was common for teens to have their smartphone by secondary school, while in Semera some did not get one until later or shared them with siblings. Those who had personal devices from an early age tended to be more tech-savvy, simply due to longer exposure. *“My family bought me a phone earlier, so [using apps] does not feel new to me,”* one girl said, crediting her early start with giving her a confidence boost – by the time she needed to use Telegram for class or do online research, she was already familiar with the basics. Besides the device itself, being able to afford upkeep (charging, repairs, accessories) and upgrades mattered. A few participants noted that as their ambitions grew (say, starting a YouTube vlog or an online business), they faced limitations like poor camera quality on their old phones. Those who could invest in better hardware or software found it facilitated more advanced usage. For instance, one entrepreneurially minded girl saved up to upgrade her phone’s camera because she realised *“the content [she] post[s] will not be quality”* without it, and improving her device ultimately encouraged her to engage more in content creation.

The cost of internet/data was repeatedly cited as a deciding factor in how far the girls could go with technology. In this regard, a supportive economic environment – whether family income or external pricing policies – made a significant difference. Several Addis Ababa participants mentioned that because their families could afford monthly Wi-Fi or ample data packages, they had the freedom to be online for hours researching, learning, and working on digital projects. By contrast, girls from more constrained backgrounds or from Semera had to be cautious with data use. One Semera student noted that she spends about ETB 50 a month on mobile credit, mainly to check in with family and access Telegram for school news; anything beyond that (like heavy video streaming) would be too costly. However, the girls also found ways to navigate financial constraints. Some took advantage of special telecom offers – for example, social media bundles and educational packages offered by Ethio Telecom. These bundles allowed unlimited use of certain apps like Facebook, WhatsApp, or Telegram for a fixed price, effectively lowering the cost barrier. As mentioned earlier, a few participants said they used Facebook’s “free mode” or text-only access to continue browsing without data charges when their balance was low. Others would download videos and PDFs while on Wi-Fi (at school or a café) to use later offline, conserving data. The existence of occasional zero-rated apps and services (such as free access to certain learning websites or government online portals) was a boon when available, as it enabled learning without worrying about cost. Although not all were aware of these options, those who were savvy leveraged them to maximise their connectivity on a budget. These economic enablers – whether through family financial support or innovative use of affordable access schemes – significantly shaped the girls’ ability to engage in positive digital activities consistently.

Crucially, the stories show that infrastructure and economic factors can either expand or limit the other facilitators. When connectivity and devices were in place, family support and personal motivation could fully translate into action; when they were lacking, even the most enthusiastic girl or helpful friend struggled to make an impact. The regional disparity here was evident: urban Addis Ababa generally offered better infrastructure (more households with Wi-Fi, schools with computer labs, stable electricity, etc.), whereas in Semera, the girls faced more patchy connectivity and had to rely on shared resources or wait for infrastructure improvements. One Semera girl poignantly noted: *“If I did not have the economic means, I would not have been able to buy my phone”*. This underlined that no matter how digitally eager she was, initial access depended on affordability. On the bright side, both communities were seeing gradual improvements, and participants in

Semera pointed to recent progress such as new telecom towers and non-governmental organisation (NGO) initiatives providing solar chargers and internet access at youth centres. These developments offered hope that the access gap would continue to narrow, allowing more girls to benefit from the digital world. In summary, having the necessary technological infrastructure and financial means was a fundamental enabling condition that, when met, unlocked all the other facilitators of positive digital engagement.

Schools, universities, NGOs, and even private companies played a notable role in several girls' digital journeys through **institutional support and training**. Formal support and training opportunities gave many adolescents the skills and confidence to leverage technology beneficially. However, access to these opportunities varied between Addis Ababa and Semera, highlighting the impact of location on the extent to which institutions could facilitate productive access.

In Addis Ababa, several participants received structured digital skills training. Some proactively enrolled in courses outside of regular school. For example, one enterprising teen in Addis listed several online certifications she had pursued – *“digital marketing, affiliate marketing, market strategy, SEO [search engine optimisation]”* – which significantly boosted her capabilities. She noted that these trainings not only taught her practical techniques (like how to create content that ranks well in search engines) but also yielded official certificates that improved her credibility. *“These courses helped me in several ways,”* she explained, *“firstly, they provided me with certificates. Without them, you are not accepted [for work] even if you know a lot.”* This shows how formal credentials from training became a stepping stone to accessing jobs and gigs in the digital economy. Universities also contributed: a few girls mentioned free or low-cost classes aimed at youth. One Addis Ababa girl, for instance, took a basic computer course offered by Addis Ababa University. Even though she did not own a personal computer at home, attending that course gave her hands-on experience and increased her digital literacy beyond what she could learn on her phone. Upon completion, she felt far more comfortable using technology and navigating the internet, which opened new possibilities for her studies and future career.

Schools themselves provided varying degrees of support. In better-resourced Addis schools, computer labs and IT classes have been part of the curriculum for some time, and participants from those schools benefited from early exposure to typing, software basics, and the internet under teacher guidance. Teacher support was also mentioned: some teachers integrated digital tools into assignments or created class groups on messaging apps to share materials. One student recalled that her teachers had *“suggested different groups and channels”* online for extra learning – an indication that educators were actively encouraging students to use digital resources positively. In Semera, not all schools were equipped at the same level, but there were signs of progress. A participant from Semera noted: *“At recent time, the school does not use manual paper-based education. We are taught and trained to use digital platforms – we have an IT class and are learning digital technology education.”* This marks a significant shift, suggesting that even in more remote regions like Semera, secondary schools are beginning to incorporate digital literacy into their teaching. The introduction of an IT class meant that girls who previously might never have touched a computer until graduation were now getting a chance to practice basic computing and internet skills in the classroom. Additionally, that participant mentioned students being trained to use digital platforms for learning.

Apart from regular schooling, special programmes and trainings run by organisations were highlighted as key facilitators. Some girls had the opportunity to attend workshops or short courses provided by NGOs, government offices, or tech companies interested in digital empowerment. For example, one participant mentioned a “*digital training by Meta*” (Facebook’s parent company) that she attended. Another recalled a session conducted by Amref (a health-focused NGO) about youth and adolescent life skills, from which, she said, “*we got knowledge*”. Though not all these trainings were solely about technology, they often incorporated components on using digital media for education, accessing health information via apps, or even basic coding and entrepreneurship, depending on the programme. School-facilitated extracurricular programmes were also noted: one girl joyfully described training she got through her school where she was “*able to lead the stage*”, and which, she said, “*helped [her] connect with many people, and motivated [her] as well.*” This indicates that programmes building soft skills and confidence indirectly empowered her to make better use of technology and social media (for example, she might feel more confident now to network or start an online initiative after that experience). Another girl mentioned that at her school, “*academically active students are sent to university and get computer-related training in the university.*” Such an opportunity would be a significant boost, exposing rural students to advanced facilities and instruction that they would not otherwise access. It exemplifies how institutional partnerships (between schools and universities) can create life-changing experiences for young people, equipping them with digital skills that translate into positive outcomes like better educational achievement or future employment.

Despite these opportunities, the interviews also revealed that not everyone had equal access to institutional support, especially in more remote areas. Several girls in Semera pointed out that while there are training programmes out there, they personally “*did not get the opportunity to participate.*” Some had never attended any digital skills workshop simply because none were offered in their vicinity, or they were not aware of them, or they could not meet the requirements to enrol. “*I have not taken any training – I do not think there are any specific trainings available [for me],*” one girl remarked, underscoring a gap in provision. Another expressed that she would be “*glad if [she] could get a chance to participate in a programme*” in the future. This highlights a potential area for improvement: even though initiatives exist, reaching all the adolescents who could benefit remains a challenge. The difference between Addis Ababa and Semera is instructive here – girls from Addis Ababa, by being in the capital, found it easier to stumble upon or sign up for digital courses and events. In contrast, Semera girls had far fewer options locally and often needed external support to gain similar experiences.

In summary, institutional facilitators – from formal ICT education in schools and universities to extracurricular training by NGOs and companies – have played a significant role in enabling positive digital outcomes for these adolescent girls. Where available, such support gave the girls technical know-how, credentials, and the assurance to navigate the digital world safely and productively. The accounts make it clear that expanding these opportunities, especially in under-served regions like Semera, could further level the playing field and allow more girls to unlock the benefits of technology. Many participants showed immense enthusiasm for learning (“*they gave us many trainings, for example, we received computer training,*” noted one youth, eager to enumerate what she had learned), which suggests that with the right institutional backing, these girls were ready to soar.

The broader social and cultural environment in which the girls lived emerged as an important contextual factor that could either encourage or hinder positive digital engagement. In general, the narratives painted a picture of a culture increasingly receptive to youth digital activity, with community norms slowly adapting to see technology as a necessary and beneficial part of life. This created a context of **supportive social norms and community attitudes**. Within that, however, there were nuances – including peer culture dynamics, societal expectations, and gender norms – that influence how adolescent girls used technology in Addis Ababa versus Semera.

One striking facilitator mentioned was the prevailing social norm that *“everybody depends on digital technology”* nowadays. Multiple girls pointed out that it was practically expected for students and young people to be using the internet for information and communication. The ubiquity of digital tech in society created a positive pressure for them to get on board. *“At this time, everything is done with digital help,”* one participant observed. *“We can access bank services and check our grades from anywhere.”* Such statements reflected a reality where going digital was not seen as optional but rather essential for convenience and progress. In both urban and rural contexts, this broader acceptance meant that girls felt justified in investing time in their devices – it was considered a smart and modern thing to do. For example, an Addis Ababa teen noted that all her classmates routinely use Telegram and other apps for school coordination, so her use of these tools was encouraged and normalised by the school community at large. In Semera, a girl mentioned that *“since everybody around me is using digital technology for information, that has contributed [to my use].”* Knowing that neighbours, relatives, and teachers were also embracing technology gave girls a sense of permission and confidence to delve into it themselves, reducing any stigma that might have existed in earlier years about girls using gadgets. In essence, a cultural shift toward digital acceptance was underway, and it had been a facilitating backdrop for these adolescents’ positive experiences.

Peer culture and social influence were frequently cited as both motivators and enablers. Peer influence in a cultural sense extended beyond the one-on-one friend support mentioned earlier to a wider feeling of *“not wanting to be left behind.”* Several girls candidly discussed how hearing about or seeing others engage with new apps and trends pushed them to try the same. *“There was a lot of social pressure and expectations that pushed me into buying a phone,”* admitted one young woman, who eventually persuaded her parents to let her purchase a smartphone because virtually all her friends had one by a certain age. Once online, the trend continued: *“When people talk about different apps and social media, you get influenced towards that,”* explained another adolescent, referring to lunchtime conversations at school about the latest TikTok craze or a useful Telegram bot. This kind of peer pressure was generally positive in outcome, as it led the girls to explore new digital tools that often had beneficial uses (educational apps, creative platforms, etc.). In Addis Ababa, where exposure to global social media trends was high, girls were quickly swapping recommendations for productivity apps or interesting websites. In Semera, peer influence played out in smaller circles – for example, if one girl in a village found a great Telegram channel for Grade 10 chemistry lessons, her friends would soon join it too after hearing her praise. In both settings, a youth culture that celebrates connectivity made the girls more enthusiastic and adventurous in their tech use.

The social environment also provided success stories and community examples that inspired the girls. Particularly in Addis Ababa, some participants referenced public figures or local entrepreneurs who leveraged

social media for good. They talked about people who had become influencers, started online businesses, or led social campaigns through digital platforms, and how seeing these achievements made the possibilities of technology more tangible. “Yes, *there are many people who get income and have changed their life by using social media,*” one girl stated, using that as evidence in support of her belief that she too could benefit from being online. This kind of community narrative – “*so-and-so built her boutique’s Facebook page and now she is selling nationwide,*” or “*an influencer I follow raised money for charity through Instagram*” – created a generally positive buzz around digital engagement. It helped counteract any negative warnings they might hear about the internet by showcasing real local benefits. In Semera, which is a smaller community, the success stories were sometimes even closer to home. For instance, an adolescent mentioned her friend who was “*working on an online business*” – even though it was small-scale, the friend was earning something and spending her time productively, which encouraged the respondent to think she could do the same. These community-level exemplars and word-of-mouth successes made the advantages of digital technology visible and culturally appreciated, thereby motivating more girls to partake in similar endeavours.

Cultural attitudes toward girls and technology also surfaced in the discussions. Historically, in many parts of Ethiopia, there has been some scepticism or conservatism about young girls using technology (due to fears of exposure to bad influences, etc.). However, the interviews suggest this was changing, albeit gradually. In Addis Ababa, most girls reported that their families and teachers treated digital skills as a normal part of education for girls, just as for boys. One Addis participant even noted that her parents’ main concern was not that she was using the phone, but that she should “*use it carefully and not get sick*”. This indicated a shift from moral panic to a more practical guardianship regarding tech use. In Semera, some gender-specific support systems existed that indirectly facilitate girls’ tech use. For example, one girl mentioned that her school “*provides support for females*”, even though it does not specifically encourage social media. Such support, while not about technology per se, create a more empowering environment for girls to take initiative, including in areas like digital learning.

Additionally, having female role models and mentors was culturally significant. A few adolescents pointed to their older sisters, female teachers, or accomplished women in their community who introduced them to new ideas or set an example that girls could excel in the digital arena. In one case, an older sister’s active use of apps (“*my sister introduced me to useful applications like a to-do list app*”) directly led to a younger girl adopting those productive habits. In another, a girl was influenced by a female cousin who regularly communicated and studied via Telegram, showing that it was acceptable and beneficial for a girl to be tech-forward. These subtle cultural endorsements from within the family or community made the girls feel that using technology to better themselves was not only safe but commendable.

Finally, the wider social context and challenges sometimes acted as an inadvertent catalyst for positive digital use. A compelling example came from a girl who described a difficult local environment – “*the environment was not safe, teachers would not be present, and we would not learn properly*”. In her case, living in a setting where the school system was faltering (whether due to insecurity, teacher absenteeism, or other social issues) pushed her to seek alternatives online. She turned to digital media to “*teach [herself] properly*” and not fall behind academically. What could have been a purely negative situation (poor schooling) was somewhat mitigated by the internet, which became a backup tutor and a gateway to knowledge beyond what her local

school could provide. This story illustrates how, on a societal level, digital technology served as a resilience tool, helping girls overcome cultural or structural barriers in their offline lives. Similarly, some participants mentioned using social media to engage with causes they care about – for instance, following religious teachings or participating in community help groups – which connected to their cultural values of faith and social support. One girl said that contributing to online campaigns for needy people and following inspirational religious pages “*inspires [her] to engage more*” with technology, because it aligns with her desire to do good in her community. In this way, the culture of altruism and community service found a new outlet through digital means, reinforcing her positive usage cycle.

In conclusion, the social and cultural milieu in Addis Ababa and Semera has been gradually aligning in favour of digital empowerment for youth. Peer influence, community success narratives, evolving gender norms, and even the drive to overcome local challenges had all created a context where adolescent girls felt encouraged to harness technology for constructive ends. While there were still differences – urban settings providing more progressive examples and rural settings catching up with targeted support for girls – the overall trend was that the environment around these girls was increasingly facilitating their digital growth. As they saw their society valuing digital literacy and witnessed technology improving lives, they were emboldened to deepen their positive engagement, creating a virtuous cycle between their digital activities and their community’s development. This exhaustive look at the facilitators – from family and personal drive to infrastructure and culture – shows that positive outcomes with digital technology arise not from any single factor, but from an ecosystem of support surrounding these young female users. With the right mix of these facilitators, adolescent girls in both Addis Ababa and Semera have been able to unlock new opportunities, learn and create in unprecedented ways, and set themselves on paths toward brighter futures in the digital age.

5.4.3 Barriers to positive outcomes

Despite numerous enabling factors, adolescent girls in Addis Ababa and Semera also encountered significant barriers – personal, economic, infrastructural, and socio-cultural – that limited their ability to benefit from digital technologies fully.

Financial constraints were among the most cited barriers. Many families could not afford high-quality smartphones, laptops, or sustained data plans. Several girls relied on outdated or hand-me-down devices that could not support certain applications or functions. Some had to stop online engagement entirely when their phones broke or when storage ran out (one girl noted “*if my phone gets damaged... if it is not repaired, I will stop using it [the internet]”*). In some cases, adolescents did not have a personal device at all and had to rely on a shared family phone – meaning if the phone’s owner was away, their access to the internet vanished. Mobile data, the main form of internet access for most, was described as prohibitively expensive. Girls often rationed their use or bought minimal data packages, reducing their ability to stream videos, download school materials, or engage consistently with online platforms. Even in Addis, where some girls had access to Wi-Fi, families sometimes could not sustain the monthly subscription costs, forcing a return to slower and less

reliable mobile networks. Focus group discussions in both cities confirmed that the high cost of devices and data strained girls' access to digital technologies.

Infrastructural limitations – particularly unstable electricity and weak network coverage – frequently disrupted digital activity, especially in Semera. Participants there described regular power outages and poor

“There are barriers for me, such as not having a good mobile phone. Another issue is that I rely on mobile data since I don't have a Wi-Fi connection. So, if I can't afford data, I miss out on many things even though I want to participate. That is one of the barriers for me.”

An adolescent from Semera shares her multilayered barriers in her digital technology usage

signal strength, which could cut them off from basic communication, let alone more advanced uses. One girl from a rural area outside Semera noted that there “*used to be no Wi-Fi*” where she lived, and electricity was a constant struggle. Respondents from Addis, though better connected overall, also reported power cuts and network delays that interfered with online learning. Even in the capital, some neighbourhoods suffered from bad reception or intermittent connectivity. These infrastructural challenges meant that forces outside the girls' control could suddenly halt access – if the power went out or the network dropped, there was little to do but wait for service to resume.

The **quality and reliability of a device** was another significant barrier. Several girls described being unable to use key apps or tools due to outdated phones or computers. One ambitious girl, Melat, shared that the Upwork freelancing app would not run on her older PC,

meaning she would need a newer device to access online job opportunities fully. Another girl wished for a PC to learn more courses and gain opportunities, noting that the lack of a computer held her back. One participant had no smartphone at all because hers had broken, and she could not afford a replacement – effectively cutting her off from the digital world until it was fixed. Feven, who was visually impaired, was effectively locked out of e-learning when her screen-reader app stopped working on her older phone (it would randomly shut off or switch modes, rendering the device unusable for her until the glitch passed). These examples show how mere access to technology is not enough – the quality, compatibility, and reliability of devices are just as important. Outdated hardware or limited storage can halt learning in its tracks, illustrating that digital inclusion requires appropriate tools, not just any device.

Digital distractions and challenges with self-discipline also emerged as pervasive barriers. Many girls acknowledged that the same devices used for learning also offered tempting distractions – social media, games, and chat apps often pulled attention away from schoolwork. Even with strong motivation and clear goals, self-regulation was a struggle. Focus group discussions confirmed that adolescents easily “*slip into addictive usage patterns*”, especially without external guidance or supervision. Participants from both Addis and Semera noted how a youth intending to study online might instead find herself scrolling endlessly on TikTok or chatting on Telegram. This tension between productive use and digital distraction reflects the double-edged nature of smartphones: incredibly powerful tools, but also portals to procrastination.

In Addis Ababa, one focus group participant reflected on the personal toll of social media use, stating: *"It messes with my time management. The first thing that I do when I wake up is check social media, and I feel almost addicted to it. Once I start my day with social media, my whole schedule lags. So, that has been my biggest challenge."* The compulsive nature of social media also affects in-person relationships. Another participant from the same city explained, *"Even when I meet up with my friends after a long time, if we have access to our phones and Wi-Fi, we no longer talk to each other; we will just continue to be on our phones."* Similar concerns emerged in Semera, where participants emphasised how digital engagement can lead to unproductive routines and even cultural displacement. One focus group participant commented: *"While beneficial, digital technology also has negative effects. For example, we waste time watching TikTok instead of productive activities."* Another linked phone dependence to a broader erosion of local cultural values, stating: *"From my observations, phone dependence has consumed all our time. Another issue is that it has made us follow foreign influences that conflict with our culture, particularly in imitating their fashion trends."* In sum, staying focused on positive outcomes was difficult when entertainment and social connections were just a tap away, illustrating a need for better digital self-discipline and time management strategies among youth.

A lack of guidance and formal digital literacy training further limited many girls' ability to benefit from technology fully. Although most had solid basic skills (for example, knowing how to use social media or messaging apps), many felt they lacked knowledge of more advanced tools or online opportunities. One girl admitted that *"the main barrier comes from me – my lack of knowledge about digital technology"*, highlighting her skills gap as a hurdle. In Semera, one participant wished for formal training in software use, and others said they probably were not fully exploiting the apps and platforms they had access to simply because they had never been taught all their features. Focus group discussions also revealed this gap in digital literacy. Semera girls noted that many talented youth *"have skills but do not get opportunities"* online because they lack proper orientation or guidance on where to channel their abilities. Participants in Addis Ababa similarly proposed integrating digital literacy into school curricula – not only for students, but for parents as well – to build a collective understanding of the digital world. The consensus was that more structured training, mentorship, or coursework on digital tools (from basic productivity software to safe internet use and content creation) would help adolescents make better use of technology and navigate online spaces more confidently.

Socio-cultural norms and gender expectations were persistent and often invisible barriers. While many families were supportive of girls' digital engagement, the girls still reported feeling scrutinized for using their phones or computers – especially when household duties or traditional expectations were in play. One Addis participant noted that her digital activities were limited because of time-consuming domestic responsibilities, which her brothers were not expected to share. Such imbalances in chores and family expectations reduced girls' time and freedom for online learning or exploration. In one interview, a girl observed that as a young woman, *"there is a societal expectation to prioritise household chores over personal development using digital tools... my brothers do not have to do as many chores as I do, so they end up having more free time"*. This dynamic means girls often have less leisure or study time to devote to beneficial digital pursuits simply because they carry a heavier burden of duty at home.

Focus group discussions also revealed the extent to which girls' digital freedom is limited. In Semera, participants agreed that family restrictions – especially around *"wasting time"* on social media or visiting

internet cafés – prevented girls from fully exploring online tools. Adolescents in Addis described similar concerns, noting how parents often questioned them for being on their phones, sometimes assuming they were doing something inappropriate or unproductive. One respondent shared that she was *"often told, 'What is the purpose of a phone for you? It might lead you down the wrong path'"*, whereas her brother in Grade 6 *"is not criticised"* for using his phone, illustrating the double standard in some families. These attitudes, often framed as protection or moral concern, led girls to self-limit their engagement out of fear or guilt. For instance, an Addis focus group participant suggested restricting social media for adolescents under 18, reflecting both a protective impulse and an acknowledgment of real digital risks. However, when applied broadly to girls, such norms can blunt the positive potential of technology for young women by keeping them away from the very experiences that could educate and empower them.

It is also notable that girls were very aware of how their experiences differed from boys' experiences in the same communities. Some adolescents explicitly contrasted their situation with that of their male siblings. One focus group participant from Addis Ababa shared how her brother had his first phone in Grade 6 while she only got hers in Grade 10: *"It was not even a fully functioning phone. I believe this is because they think girls are more influenced by digital technology and social media and are more prone to experiencing its negative side effects."* Similarly, Meseret from Semera shared the sentiment: *"In our culture, it is common to hear people criticise phone usage even if it is for productive reasons... I do not have my phone even though my younger brother has one because he pressured them into buying it for him."* These anecdotes underscore how gender biases in families and communities can delay or limit girls' access to personal devices and the internet, putting them at a disadvantage compared to boys.

Online harassment and safety concerns emerged as a theme – closely tied to socio-cultural attitudes – and deterred girls from full digital participation. Some respondents noted that girls who were active on social media faced particular risks like hacking, cyberbullying, or having their content misused. For instance, one Addis girl observed that women's social media accounts often get hacked or flooded with abusive messages, and that *"disturbing technologies have come out"* (such as fake videos or photo manipulations), which have resulted in young women removing their photos from the internet. Participants also reported that girls receive unwanted attention online simply for being female. One explained that on Telegram or group chats, unknown men would randomly message her because she was a girl, something her male peers did not experience. Female adolescents thus had to be vigilant, often resorting to blocking strangers or making their accounts private to avoid harassment.

The possibility of reputational harm or gossip added another layer of restraint. Girls discussed hearing stories of peers' private pictures being leaked without consent, which created a climate of fear – they worried that *"the same might happen to me"* so avoided sharing content that boys might share freely. Culturally, if a girl ignores or blocks unwanted male advances online, she risks being labelled "rude", and if she posts content (like a TikTok video), she could face community gossip or condemnation for *"doing this and that"* in ways deemed inappropriate. As a result, many girls self-censored and said they *"cannot truly be [themselves]"* on social media because of the potential backlash. One girl stated frankly that whenever a woman posts something public, *"the negative feedback can discourage you from expressing your feelings, and this is especially difficult for women"*. Some families, hearing of these risks, become stricter – for example, forbidding

daughters from posting on TikTok or limiting their time online – out of concern for the girl's safety and reputation. These online safety concerns compound the barriers to digital engagement, as girls must constantly navigate not just the technology itself but also the potential personal risks that come with visibility in online spaces. The outcome is that young women often proceed more cautiously or choose not to participate in certain online activities at all, thereby missing out on some positive opportunities due to an atmosphere of intimidation and vulnerability.

5.4.4 Negative outcomes and contributors

While adolescent girls in both Addis Ababa and Semera expressed optimism about the benefits of digital technology, they also openly acknowledged the significant downsides they face. These negative outcomes included personal struggles such as distraction and overuse, as well as structural challenges like harmful content, harassment, and social stigma. The contributors to negative outcomes ranged from individual behaviour and platform design to social norms and infrastructure gaps.

Distraction and loss of time were the most commonly cited challenges. Girls repeatedly noted that social media, entertainment apps, and constant notifications often led to procrastination, sleep loss, and decreased academic performance. Several described feeling "addicted", particularly to platforms like TikTok and Instagram, with some directly linking their overuse to poor grades or failed exams. One Addis girl confessed that social media cost her a university opportunity, prompting her to delete TikTok altogether. Others admitted they lost hours scrolling instead of studying or doing chores, and even when they tried to manage it, the pull of their devices proves strong. Both focus group discussions confirmed that distraction was a widespread issue. A focus group discussion participant in Addis Ababa also highlighted how using the technology and has affected her ability to concentrate: *"The way we consume information has changed... These days, people only have the attention span to listen to and watch short videos, and that is it. It has gotten to the point where when I am sitting inside a classroom, I can barely follow what the teacher is saying after the first 15 minutes."*

Many girls also described feeling emotionally depleted after prolonged online engagement. Constant comparison to curated online personas triggered insecurity and lowered self-esteem. The fear of being left behind or not matching peer achievements online created a sense of inadequacy, especially when

achievements were publicly displayed. While some girls coped by limiting screen time, others internalised these feelings as signs of personal failure, heightening their vulnerability to stress and guilt.

Health-related consequences were also mentioned, including eye strain, headaches, and disrupted sleep from prolonged screen time. Hanan from Semera, for instance, acknowledged how she found her phone useful for information and entertainment. However, she added, *"using it for longer periods has caused depression, headaches, and other negative outcomes."* Girls shared efforts to reduce screen brightness or take breaks after experiencing physical discomfort. In both cities, participants reported psychological effects like stress, guilt, or reduced self-esteem, especially when they felt they were overusing their devices or comparing themselves to idealised images on social media.

These physiological and psychological effects were often worsened by late-night use, especially when adolescents had few restrictions or when digital engagement felt like an emotional escape. Some described poor sleep patterns, waking up tired, or even failing to sleep due to scrolling and messaging habits. These habits, though common, were difficult to break and often went unmonitored by families, exacerbating long-term consequences.

Exposure to harmful content online was another recurring theme. Adolescents in both Addis Ababa and Semera voiced strong concerns about exposure to harmful content online, particularly for girls and younger users who may accidentally encounter sexual, violent, or culturally inappropriate materials. The girls described how they themselves had accidentally encountered sexual or violent material, misinformation, and content that clashed with cultural or personal values.

A focus group participant from Semera highlighted the dangers of unfiltered platforms: *"YouTube contains inappropriate videos that should be restricted for children. Prolonged phone use damages eye health, affects mental wellbeing, and exposes users to harmful content – such material should be limited."* Another focus group participant from Semera echoed this concern, drawing attention to how young people cannot often navigate digital risks safely: *"Youth dependence on digital technology brings more negative than positive consequences. Young people engage with harmful aspects, especially children who access adult phones and view inappropriate content without discernment. This could seriously impact children's development."* Similar sentiments were shared in Addis Ababa, where one focus group participant emphasised the need for protective measures, stating, *"I would recommend some application only to be reserved for people 18+ so that teenagers under 18 are not exposed to the harm of social media."* Together, these reflections underscore a shared anxiety across locations about the unintended consequences of unrestricted digital access, particularly for children and adolescent girls. They point to an urgent need for age-appropriate safeguards, content moderation, and digital literacy efforts that can better equip youth to navigate online spaces safely and responsibly.

“

In digital spaces, women face the pervasive threat of gendered harassment.

Many are hesitant to voice their opinions online due to concerns about personal safety and societal judgements. Additionally, some are unable to fully engage in the digital world because they lack access.

”

Bitania from Addis Ababa shares her take on the multifaceted challenges women face to access or remain in digital spaces

Gendered online harassment emerged as one of the most serious external risks. Many girls reported being flirted with and receiving unwanted attention and unsolicited messages from men online. Even when not directly targeted, the awareness of harassment created a background of caution and fear.

A focus group participant in Addis Ababa reflected on how social media can expose girls to emotionally harmful relationships initiated by older men: *"Social media has become the reason why so many young girls get into relationships and suffer from avoidable traumas. The men who approach young girls using social media are older guys who have the tools to manipulate them."* Bitaniya, also from Addis Ababa, described how these experiences shape girls' online behaviour: *"Because you are a girl, some people will talk to you online even though you do not want to. When you hear stories of girls whose private pictures got leaked, it makes you fear the same might happen to you. Furthermore, based on culture, guys and society may think you are rude if you do not reply or block people. You also lack freedom in what you post because of stereotypes and fear of gossip."* Fafi, a 22-year-old from Semera, emphasised how a lack of awareness compounds these vulnerabilities: *"I have not faced any harassment personally, but I have heard of many instances where youth were exposed to harmful situations due to a lack of awareness about social media usage."*

Some also mentioned being careful about what they posted to avoid gossip or judgment from peers and community members. Although they may not have experienced it personally, witnessing other women's experiences makes them more cautious. Loza, an adolescent from Addis Ababa, shared her experience: *"I have seen some women who are active on social media get hacked and bullied. I think this is one of the factors that stops women from actively engaging in social media. For example, some new disturbing technologies have come out, and these have alarmed women to stop posting their pictures and take down what they have already posted – even me."* The fear of being surveilled or judged by both peers and adults was pronounced. Girls reported being added to groups without consent, receiving unsolicited messages, or having posts scrutinised by family or community members. These forms of social policing, often driven by cultural norms, reduced girls' digital confidence and caused emotional stress, even when they had not done anything inappropriate.

Cultural sensitivities also emerged as a contributor to negative experiences. Girls in Semera in particular voiced concern about the influence of foreign content and how it shaped clothing, speech, and behaviour in ways they felt were misaligned with local values. Several adolescents observed how the imitation of trends seen online created tension with family members or elders, who viewed such behaviour as disrespectful or corrupting. This led to increased generational conflicts and sometimes internal confusion about identity and belonging. Even in Addis Ababa, where digital exposure was more normalised, some participants described the discomfort of feeling out of place in their communities due to the lifestyle shifts that digital technology enabled. These tensions, while not always openly addressed, contributed to subtle yet persistent psychological strain.

A lack of digital literacy and resilience was a significant contributor to negative outcomes and left the girls vulnerable. Many adolescents admitted they were ill-equipped to assess risks, set boundaries, or regulate their emotional reactions to negative online encounters. Girls often lacked awareness about blocking, reporting, or filtering content and expressed a need for structured support to help them navigate online environments with confidence. This lack of preparedness left them more susceptible to scams, misinformation, emotional manipulation, or exposure to triggering material. It also prevented them from fully

leveraging the benefits of digital spaces, as fear or uncertainty led to withdrawal from online platforms rather than constructive engagement.

Accessibility barriers remained profound **for adolescents with disabilities**. Mainstream devices and apps are not always designed with disabilities in mind. Feven, the adolescent with a disability from Addis Ababa, shared how some of the applications on her phone did not work properly: "...[W]hen it reads both English and Amharic at the same time on my phone, one of the voices becomes lower in volume, so I have to choose one language. I think this issue is because of my phone – it is an Infinix phone; I think Samsung is better for this issue." However, Feven cannot afford to buy a Samsung phone or a laptop due to income constraints. This shows the multiple barriers to accessing digital technologies that persons with disabilities face.

5.4.5 Gendered outcomes and barriers

Gender identity shapes how adolescent girls in Addis Ababa and Semera experience digital life – amplifying both opportunities and risks. Across interviews and focus group discussions, girls described navigating double standards, time constraints due to gender roles and safety threats online, all while asserting agency in environments that often reflect offline inequalities.

Girls were subjected to **gendered norms around technology use**. This included family attitudes which played a significant role in shaping adolescents' access to and confidence in using digital technologies, often privileging boys over girls. Many noted that younger brothers often had personal phones while sisters did not, and neighbours or relatives insisted that women did not need a phone. In Addis Ababa, participants noted how gendered household expectations limited girls' time and opportunity to engage with digital tools. Girls said they had less free time than their brothers, whose evenings were often unscheduled. They might have access to a phone but could not use it meaningfully because they were busy with schoolwork and chores. Several participants described planning their digital activities around household tasks and sometimes waiting until late at night to go online. Girls said they were expected to "*use phones responsibly*". In Semera, families often asked girls why they weren't helping with domestic work or studying and limited their online time. Community members still told girls to put their phones away and focus on housework. The lack of private time meant girls could not explore digital tools or develop digital skills, leading to inequalities in skills acquisition.

In Addis, adolescent girls said social media platforms were dismissed as "*for girls*", while boys' tech use was associated with gaming, video editing and other "*technical*" apps. One participant noted that women and girls were very active on Instagram and Snapchat, whereas "most of the men think of social media as something for women to take pictures and post on it". Such views discourage girls from pursuing deeper tech engagement and sustained the perception that sophisticated digital skills – like gaming, editing or coding – were "*for boys*", even when girls were interested.

One focus group participant described the contrasting treatment of siblings when receiving their first phones: "*When my parents bought my brother his first phone, he got to go to the store with his friends and choose which phone he wanted. However, when it came to my sister, my dad bought her a smartphone without asking her what she wanted. They justified this by saying, 'Well, he is a boy'. Our parents also assume that the boys in the family know more about digital technology and trust their judgement*". Similar sentiments were echoed in Semera, where cultural and religious norms were seen to grant boys greater digital mobility and freedom. One

participant noted: *“Males have more time and freedom because families put more pressure on females. Often, when females spend too much time online, their families restrict them, which leads to males engaging more actively in digital technology”*. A focus group participant in Semera summed up the general feeling: *“Males face no restrictions, females do”*.

Another adolescent (a focus group participant) explained: *“Our community still expects girls to do the house chores and help with other work around the house while the boys are not burdened with such responsibility. That directly affects how girls and boys engage with digital tools, because the latest and expensive digital tools are provided for boys. However, if we as girls were to ask for the same kind of devices, the response we would get from our parents is, ‘What would you even do with it? If you want to use a phone, you can use mine’”*.

This inequality also created a **skills gap rooted in opportunity**. Because boys often handled tech-related tasks at home and became more proficient and confident in these; girls were rarely encouraged to explore, fix or “tinker” with devices. Several participants noted that boys were allowed to choose and manage their own devices and assumed to know more about technology, while, as mentioned, girls had to accept whatever phones their parents give them. With limited practice, girls felt “late” or “behind” when learning new applications; these time constraints also prevented them from considering advanced skills such as coding or online learning. Across groups, the consensus was clear: disparities stemmed from opportunity, not ability.

As discussed, many girls faced **online harassment** and were concerned about their **digital safety**. Girls described receiving unsolicited messages or being flirted with simply for being present online. Some kept their profiles private, avoided posting photos (fears of deep-fake pictures made them hesitant to share photos) or self-censored as protective measures. Participants in Semera said families feared that if daughters posted videos or became visible on social media they could not be controlled, so girls were banned from internet cafés or from having public profiles. Adolescents in Addis faced fewer outright bans but described constant self-monitoring to avoid judgement or harassment, pressures they felt their male peers did not share. Families were also worried about robbery and harassment in public spaces, discouraging girls from carrying laptops or wearing headsets outside. These layered risks meant that digital spaces often felt unsafe for girls.

Despite these barriers, digital spaces could also be **empowering**. Girls described following female role models on social media, joining women-centred channels and discovering scholarship or mentorship opportunities. One girl found motivation from a Telegram page featuring Ethiopian women engaged in science, technology, engineering, and mathematics (STEM) disciplines. Others mentioned digital groups that offered peer support, advice and solidarity – spaces not available offline. Focus group discussions reinforced these benefits, with adolescents in Semera noting a shift toward greater acceptance of female tech use. Although slow, these changes suggested a narrowing gender gap.

These reflections revealed differing views but a shared recognition that socialisation, not inherent difference, underlies the tech gap. Girls actively resisted constraints by negotiating with parents, educating themselves on digital safety and helping each other explore new platforms. Focus group discussions became spaces for critical reflection – one Addis girl suggested gendered tech patterns might be natural, while another pushed back, arguing that her family’s biases, not innate ability, shaped her brother’s confidence. Parents’ assumptions about gender and capability, combined with domestic expectations, continued to privilege boys

over girls, yet the girls' strategies showed how agency and support networks could begin to erode these double standards.

5.4.6 Conclusion

The digital experiences of adolescent girls in Addis Ababa and Semera revealed a complex interplay of empowerment and constraint. On one hand, these young women had embraced digital tools to enrich their education, social lives, and self-expression; on the other hand, their engagement was circumscribed by enduring socio-economic and gender-based barriers. The findings made it clear that technology, for these girls, was both a bridge to greater opportunity and a mirror reflecting the inequities of their offline world.

This group's digital reality was one where the internet acted as an equaliser in education and a lifeline for social connection. Many girls routinely turned to online resources to fill gaps in their formal schooling or learn new skills, effectively levelling the playing field when local educational quality or opportunities fell short. At the same time, digital communication helped them maintain supportive relationships across distances, nurturing a sense of community that transcended geography. In daily life, a smartphone was more than a device – it was a study aid, a library, and a social space that offered adolescent girls a degree of autonomy in pursuing knowledge and friendships.

Crucially, the findings showed that access to digital platforms provided new avenues for personal empowerment and voice. Through creative expression on social media and participation in female-centric online groups, many girls asserted opinions and talents in ways that were not possible for them offline. This visibility and connectedness were particularly meaningful in contexts where young women's voices had traditionally been muted. A few even leveraged technology for economic and professional growth – finding jobs, freelance work, or inspiration from female role models in fields like science and media. Such cases, though not widespread, hinted at significant potential for financial independence and building career ambitions through digital exposure.

However, these opportunities existed alongside stark structural challenges that shaped the girls' digital lives. Economic constraints were a constant theme: the high cost of smartphones, limited access to laptops, and unaffordable data plans meant that many girls had to ration their connectivity or make do with outdated hand-me-down devices. Together, these financial and infrastructural barriers set a hard limit on how fully adolescent girls could leverage the digital world for their advancement.

Equally impactful were the socio-cultural norms and gender expectations that subtly yet persistently restricted girls' use of technology. The findings highlighted that adolescent girls shouldered disproportionate domestic responsibilities, leaving them far less discretionary time to explore or learn online compared to their male peers. Family attitudes, often under the guise of protection, imposed stricter scrutiny and limits on girls' device use – a double standard that boys in these communities seldom faced. As a result, many girls self-censored and exercised caution in their online behaviour, ever mindful not to transgress the boundaries set by parents or society. This climate of scrutiny and conservative expectations meant that even when digital access was available, girls could not embrace it with the same freedom and confidence as boys, curbing the transformative potential of their online engagement.

The digital world itself could also introduce new risks and pressures that weighed heavily on the adolescents. Online harassment and exposure to harmful content emerged as routine threats, painting an internet landscape that could be as intimidating as it was inspiring for girls. Coupled with personal struggles like distraction and overuse leading to lost study time or sleep, it was evident that connectivity came with a cost to their well-being.

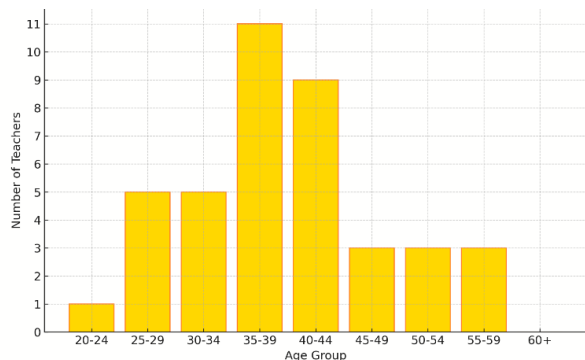
Despite these adversities, the resilience and agency of adolescent girls stood out as defining themes. The fact that so many continued to pursue knowledge, maintain social ties, and even innovate within such constraints spoke to their determination and adaptability. Girls devised coping strategies – from curating their social media privacy settings to deleting apps that hindered their studies – demonstrating a mature awareness of both the benefits and pitfalls of digital life. Notably, participants with disabilities illustrated both the profound impact of inclusive technology and the gaps that remained. In essence, the lived experiences of girls in Addis Ababa and Semera underscored that digital inclusion was not merely about the presence of technology, but about dismantling the layered economic, social, and institutional barriers that inhibited true empowerment.

6. Teachers

6.1. Female teachers' context and population profile

Teachers who participated in this study came from private and public schools in Addis Ababa and Mekelle, primarily teaching at primary, secondary, and tertiary levels. Their ages ranged from 23 to 55 years, with the majority (22) holding at least a bachelor's degree, while the rest had master's and other qualifications. Marital status was highly varied, though a slight majority were married or divorced children.

Figure 5: Teacher age groups

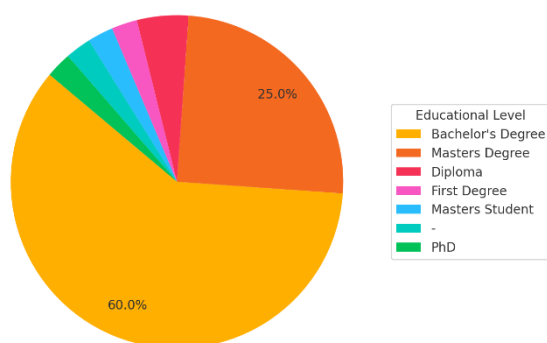


As the capital, Addis Ababa benefits from a longer history of digital infrastructure development, with relatively better affordability and accessibility. Mekelle, while still an urban area with reasonable access, falls behind in comparison – especially as it continues to recover from the recent two-year war that significantly damaged key infrastructures like electricity and communication. This contrast was notable in

both the in-depth interviews and focus group discussions. While there were similar outcomes and aspirations for digital technology use to enhance administrative and teaching practices in both cities, the challenges they faced were often shaped by contextual disparities, particularly Mekelle's post-conflict status. This meant that even some shared challenges sometimes carried unique nuances for teachers from Mekelle. For instance, while the economic challenges faced by teachers in both cities stemmed from insufficient salaries, teachers in Mekelle faced the additional challenge of their incomes being severely disrupted by two years of violent war.

Figure 6: Educational level distribution of teachers

Educational Level Distribution of Teachers



Based on the responses of almost all respondents, mobile phones, laptops, and personal computers were the commonly used technologies for various purposes. Although mobile phones were the most common tools used to access digital technology, several teachers in Addis Ababa also reported owning laptops and tablets. While teachers in Mekelle also had access to additional devices, it appeared to be slightly more limited compared to teachers in Addis Ababa.

6.2. The digital journey of teachers

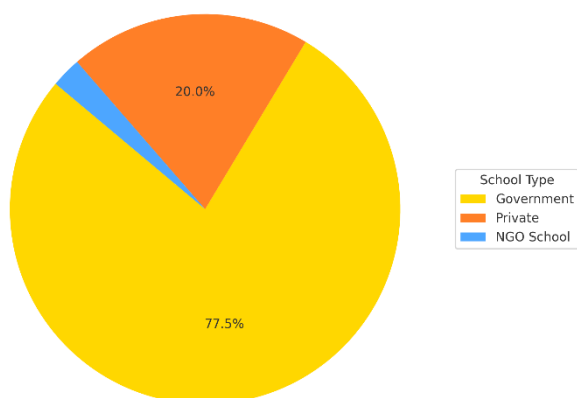
The journey of digital technology usage among teachers in Addis Ababa and Mekelle was a story of gradual adoption, adaptation to challenges, and the transformative impact of connectivity on their professional and personal lives. While their experiences shared common threads, regional nuances, and individual circumstances shaped unique trajectories.

6.2.1. Early beginnings: First devices

While teachers in both cities had their first introduction to digital technologies through different devices, most began with basic mobile phones acquired between 2005 and 2008. In both Addis Ababa and Mekelle, these devices were often purchased primarily for communication with loved ones.

Figure 7: School type distribution

School Type Distribution (Updated)



For instance, motivated by the need to maintain contact with family while working in Tigray's western zone, Birhan from Mekelle acquired her first phone as early as 2006. Similarly, Brikiti recalls: *"I bought my first mobile phone in 2005 when I was a student at Gondar University. I had left my child with my family, and it was difficult to use public telephones... so, I bought [mobile] phone to be able to communicate with my child and my mother."* Although access to mobile phones, enabled by the then-growing telecommunication infrastructure, served as an important entry point into the digital world, the poor connectivity and coverage at the time were a challenge for some. For instance,

Girum from Addis Ababa shared how she sometimes had to climb a mountain to get better reception when she had her first phone in 2007, following her relocation to Harar.

For teachers with disabilities, needing access to specialised features through digital devices significantly influenced their adoption of mobile phones. Many adopted devices to gain independence and overcome

challenges related to their disabilities. Asnaqech shared how her first phone helped her become less dependent on others: *"What motivated me to get my first phone was the struggle I was facing trying to find people who would read my notes for me... I realised I needed a mobile phone to allow me to record notes on my own without being dependent on others."* Such examples highlighted how phones equipped with adaptive technologies had been transformative tools for teachers with disabilities, enabling them to navigate both personal and professional tasks independently.

6.2.2. Transitioning to smartphones and other devices

Despite the introduction of mobile data networks since 2007, most teachers only acquired their first smartphones in the mid-2010s, between 2015 and 2019. This late adoption often correlated with the affordability and availability of smartphones, factors that continued to strain their overall experience and aspiration to adopt new digital technologies. Nonetheless, teachers shared how they managed to buy their first smartphones and even laptops by saving from their salaries and through the support of family members. Genetesh, for instance, used *Equb*, a traditional Ethiopian savings system, to make her purchase of a laptop possible. Her journey to acquiring her laptop demonstrated how teachers, even when faced with the high cost of devices, used different resources to acquire what they needed. Reflecting on this experience, she said: *"I bought my laptop by joining Equb. It took me around a year and a half to save up for it. Back then, it cost around 18,000 ETB."* Despite the laptop being outdated, she continued to use it for tasks like preparing exams and tutoring her children, repairing it whenever necessary.

The growing transition of teaching-learning activities and communication to online spaces was a key driver in smartphone adoption. For instance, Rahel from Addis Ababa shared how she got her first smartphone during the COVID-19 pandemic, as she needed to use Telegram for remote teaching and communication with students. The use of internet-based applications such as Telegram for communication and platforms such as Google and YouTube to enhance their lesson plans was a recurring theme.

Despite circumstances necessitating access to smartphones and the internet, some teachers still could not afford to own one, and they often found themselves relying on others for access. Abeba said: *"...I have an interest in using the internet, but since I could not buy [a smartphone], I don't use the internet. I miss a lot of things due to a lack of internet."* Similarly, Abrehet from Mekelle shared how she had to rely on her son whenever she needed to use the internet. As she put it: *"I can't afford a touchscreen phone, but I'm interested in having one. Even when I'm preparing to teach, I sit with my son, and he helps me find references on Google. I would be happy if I could afford all the devices and use them, but my income doesn't allow it."* Thus, the inability to afford smartphones significantly affected the teachers' professional performance and growth.

The inability to afford smartphones created a clear divide among teachers, where those with access could fully participate in digital teaching and professional development, while others were left behind. This disparity not only limited the professional growth of teachers like Abrehet and Abeba but also widened the gap in their ability to deliver quality education compared to colleagues who had the means to integrate technology into their teaching practices. These challenges became even more compounded for teachers with disabilities who needed devices compatible with assistive technologies such as Job Access with Speech (JAWS) or TalkBack. However, the more features and compatibilities a phone had, the more expensive they were, further complicating the affordability of smartphones for these teachers. As Hareg explained, *"phones*

that have these apps and are effective for disabled people are more expensive than entry-level [smart] phones." Similarly, Bezawit highlighted the struggle of using outdated or borrowed devices: *"The phone that I have currently is a borrowed phone... it has limited me from getting the services I would like out of it."*

This transition from feature phones to smartphones and other digital devices, despite the existing challenges and disparities, highlighted the significant transformation in both the personal and professional lives of teachers in Addis Ababa and Mekelle. On a personal level, these devices enhanced their ability to stay connected with loved ones, monitor their children's well-being, and access timely information. Professionally, smartphones had revolutionised their teaching practices by improving efficiency and enabling access to updated teaching materials and innovative strategies. As one teacher from Addis Ababa noted, *"we download different software on our phones to help us excel in our teaching,"* underscoring how digital tools had empowered them to deliver more effective lessons to their students.

6.2.3. Connection preference and cost

Teachers in both cities – Addis Ababa and Mekelle – reported clear preferences in how they connected to the internet, determined by cost, reliability, and availability. Wi-Fi was widely preferred whenever available, with many citing its cost-effectiveness and stability. As Getenesh from Addis Ababa explained, *"I prefer Wi-Fi because it is cost-effective and great value for money."* Similarly, others highlighted that Wi-Fi allowed them to stream videos, download large files, and work without interruption.

However, not all teachers had reliable Wi-Fi access. Several respondents shared that mobile data remained their primary connection despite its cost. Bezawit, a teacher with a disability from Addis Ababa, noted: *"I use data mostly. I only use Wi-Fi when there is access to it at my workplace or if I can have access to it in places I visit. I don't have Wi-Fi access at home."* For many, mobile data was a fallback when Wi-Fi was unavailable or unstable. Lemlem from Mekelle said: *"My typical internet connection at home is Wi-Fi. However, when I require access outside of that network, or if I need to quickly look something up while away from home, I rely on mobile data."*

The affordability of internet – whether data or Wi-Fi – was dependent on the teachers' income, institutional support, and the tasks they performed online. Some considered the expense disproportionate to their income. As Rahel put it: *"I spend about 15 Birr [USD 0.10] daily... 200–300 Birr [USD 1.5–2] a month, but the cost I incur on data is not affordable compared to my income."* Others like Mihiret said *"I think it is expensive, but I can afford it,"* stating that she spent between ETB 600–1000 (US D4–7) per month. There were also teachers like Mamit, a university instructor in Mekelle, who barely tracked her usage as the spending was proportional to her income, and she also had wide access to Wi-Fi at work.

These accounts showed that while Wi-Fi was generally preferred, access to it was uneven and shaped by broader economic and infrastructural realities. For some, like those with stable institutional support, connectivity was seamless and affordable, enabling them to fully enjoy longer hours of connection and integrate digital tools into their daily routines. For others, particularly those relying on mobile data or living in areas where networks were unstable, internet use remained a burden, but a necessary one.

6.2.4. Time and dependency

Teachers' experiences with digital technology revealed significant variation in both the amount of time spent online each day and their perceived dependency on these tools. Responses showed not only a spectrum of engagement but also highlighted underlying factors that shaped these patterns. Some teachers reported spending extensive periods online, ranging from several hours to nearly all day. For example, participants like Mamit and Lewtnesh described being online *"the entire day"* or *"more than six hours,"* often facilitated by reliable workplace access and the integration of digital tools into their teaching routines. In contrast, many teachers broke up their internet use into shorter sessions throughout the day or reserved specific times such as evenings for digital activities. Lemlem described her usage: *"I dedicate my evenings to internet use, and I also spend about 30 minutes online at the office. This results in a total daily internet usage of roughly two to three hours."* Patterns like Lemlem's illustrated how women utilised their available free time while also strategically making efficient use of available connections throughout the day.

On the other end of the spectrum, affordability and time constraints emerged as barriers for some teachers; those who spent less time online frequently mention using borrowed devices or being unable to afford more consistent connectivity. Some teachers, such as Serkalem and Desta, reported minimal usage, often citing heavy workloads, long commutes, or reliance on borrowed devices as limiting factors. Desta shared the following experience: *"Currently, I use the internet on someone else's phone for about ten minutes at home and about an hour at school. Because I travel a long distance to teach, I don't have much time to use the internet."* Meanwhile, teachers who used the internet more often had workplace access or had integrated digital tools more into their teaching practice, such as Birikti: *"...almost everywhere I go, I check my messages, primarily WhatsApp, to see if there's anything from work, either from my department or the college."*

When asked about dependency, teachers' self-assessments ranged from expressing strong professional reliance to conscious moderation. Several teachers, such as Zewdu and Zayd, acknowledged that digital technologies were essential for their work. *"It's mandatory to use reference books on it, so I am dependent on them,"* said Zayd. Zewdu was careful about calling herself 'dependent' on digital technology and underscored she was only depended on it for work purposes: *"I'm not dependent [...] But I am very dependent in the aspect of my work life."*

In some cases, teachers like Kindihafti avoided labelling themselves as dependent as they felt like that would compromise their agency. For instance, although she described not having a phone as *"[feeling] like living in the dark,"* she said she was not dependent on it. Instead, she said: *"I don't consider myself dependent on my phone because I only use it for work-related purposes [...] dependency can be equated to addiction, and I wouldn't describe myself as addicted. I only use it occasionally to stay connected with my family, colleagues, or students' parents."* This showed that teachers' framing of how digital technology was interwoven into their jobs and personal lives was often seen as an active and necessary choice for efficiency rather than passive attachment.

For teachers with disabilities, dependency on digital technology meant something different. For visually impaired teachers like Asnakech and Birhan, they felt dependent on their phones and tools that had enhanced their everyday life – without them, they would have been dependent on others. Birhan shared her experience: *"I believe I am dependent on my phone. For example, if my white cane [connected to phone] stopped working,*

there is no way I would be able to get home unless I call someone and ask them to take me home." While Asnakech said she felt dependent on her phone for her reading and recording her voice, she also said that she could not be dependent on things that she did not have access to, such as computers: *"I can't be dependent on the computers since they are not accessible to me."*

These insights indicated that while some educators were leveraging digital technologies extensively in their work and daily lives, significant barriers remained for others – including time poverty, the need to share devices, accessibility, and cost – that limited equitable participation in the digital sphere.

6.3. Everyday use and practices

6.3.1. Frequently used applications

Teachers in both cities relied on a variety of applications to meet both their professional and personal needs. For professional use, Telegram stood out as the most frequently used app, enabling school communication and the sharing of educational materials, and replacing traditional paper-based tasks. As Tsigereda from Addis Ababa put it, *"...we now do most of the work that used to be done on paper via Telegram – downloading materials to our phone or laptop and reporting through it."* Similarly, Birhan from Mekelle uses *"Telegram and WhatsApp to send finalised information to my academic colleagues and departmental association."* WhatsApp, although it lacks some features compared to Telegram, was also commonly used for smaller-scale and immediate communication.

Google was the most-used search engine for finding educational resources and downloading teaching materials essential for lesson planning. While there was no mention of a specific website or platform accessed via Google, it was often used as a catch-all term to refer to resources found via the search engine.

YouTube was another key platform used to find supplementary teaching content. A visually impaired teacher from Addis Ababa said, *"... I also use YouTube videos to update myself on the lesson I teach my students, and since I am an English teacher, YouTube videos help in developing my spoken English."*

Although not frequent, AI tools like ChatGPT and Gemini were also mentioned by some teachers who were exploring their generative features to complement their teaching materials. For instance, focus group participants in Addis Ababa shared how they used ChatGPT to help them find innovative ways to deliver lessons. However, they were also somewhat aware of the risks of information inaccuracy that came with the use of generative AI. As one participant shared *"...I only use ChatGPT to help me find innovative ways to deliver lessons to my students...but I am aware that all the information I get on there is not accurate"*. Similarly, Getenesh from Addis Ababa expressed scepticism about AI tools due to occasional inaccuracies in their responses. She explained her approach: *"Many of its [Gemini] answers contain mistakes, so I deal with them as if it's similar to a chat [with a person]."* Despite this, she used Gemini when she had access to free Wi-Fi at home, particularly for exploring economics-related questions, her field of study.

While AI tools had been helpful for some teachers in Addis Ababa, teachers with disabilities faced additional challenges in navigating platforms like ChatGPT due to compatibility issues with assistive applications. As one visually impaired teacher noted during a focus group discussion: *"...for visually impaired teachers, it's a little*

difficult for us to utilise all the new and upcoming platforms and software such as ChatGPT, because there is a compatibility issue for such software to function on our devices."

Interestingly, teachers from Mekelle hardly mentioned any use of AI tools. While this did not conclusively indicate that AI usage was uncommon among them, it suggested that other tools were prioritised instead. For example, many teachers in Mekelle shared how YouTube was an important tool integrated into their teaching practices. They used it extensively for professional development and explaining complex topics more effectively. Thus, despite regional differences in specific tool adoption, this contrast demonstrated how available tools had significantly transformed teaching-learning processes in both cities.

Although not widely discussed among focus group participants, one Amharic-language teacher from Addis Ababa voiced her apprehension about her professional relevance due to AI tools: *"As an Amharic teacher, I believe that relying on AI to generate questions – whether true/false or multiple-choice – diminishes my role in the learning process. If AI creates questions based on what I teach, it raises the question of my relevance in this scenario."* A more common concern among teachers, especially those in Mekelle, was the worry about the use of the internet (including Google and possibly AI tools) to copy answers or assignments. Teachers said this meant students lacked engagement with learning materials and sought shortcuts that they believed compromised their learning process. These perspectives show a growing concern and recognition of how digital tools and the internet are reshaping both teaching roles and students' learning processes.

In their personal lives, teachers both in Mekelle and Addis Ababa relied heavily on Telegram, WhatsApp, and IMO for communication, with each platform playing a distinct yet complementary role in their everyday lives.

Telegram remained the most frequented app among teachers due to its role in keeping them connected with family and friends while also providing access to news updates. The multi-purpose features of Telegram – facilitating both chats and calls, as well as being a platform commonly used by news outlets – made it highly convenient. Simret from Addis Ababa shared how she used it to stay in touch with her husband, who had recently moved abroad: *"For me, the app I use the most is Telegram primarily to stay in touch with my family, particularly those at a distance. It's especially helpful now that my husband is abroad, it allows me to stay connected with him."* Similarly, Abeba from Mekelle shared how Telegram allowed her to reconnect with her family who were outside of the country, and whom she has not been in touch with for a long time; *"... it is very important because it helped me in finding my family abroad,"* she said. Telegram was also used as a main source of news and information to stay updated about current issues. As Asefu from Addis Ababa said, *"I don't watch TV for news anymore; I get updates on my phone through Telegram."*

Facebook and TikTok were also used to keep in touch with family and friends and stay informed about current events and health updates. Rahel, a teacher from Addis Ababa, shared a powerful example of learning how to help her child by watching a medical video on TikTok, created by a male doctor from Jimma and highlighting how digital platforms connected people across regions in meaningful ways.

6.3.2. Online communities

Teachers in both Mekelle and Addis Ababa actively participated in various online communities, primarily through platforms like Telegram, WhatsApp, and Facebook. Most teachers indicated that they were part of a Telegram group created by their respective schools or other teachers. Birhan, a 39-year-old university

instructor from Mekelle, highlighted the flexibility and functionality of the school groups she was a part of: *"We have many groups on Telegram, Viber, and WhatsApp at the office for transferring and sharing information, and for learning new things in our department. So, they're important. The channels are from the department, the association, the Mekelle University online group, and various other groups. They're used to send and receive a wide range of information."* Birhan's experience, shared by many teachers in both cities, illustrated how the use of digital technologies for communication catered to teachers' diverse needs, topics, and preferences, helping to streamline both teaching and administrative tasks.

In Addis Ababa, teachers were part of groups such as the "Addis Ababa Education Bureau" Telegram channel, which shares job vacancies and educational updates. These communities served as hubs for professional collaboration, resource sharing, and personal development. For example, Girum said how she used this platform to disseminate vacancies in posts that helped 12 individuals secure jobs. Highlighting how she engaged with communities across cities, Girum said: *"I share this information with different teachers, and I also engage by commenting. Two years ago, there was a post about vacancies for Afaan Oromo and Amharic teachers. I shared it with people I know, and as a result, 12 people came to Addis Ababa from Harar."* Similarly, Rosa from Mekelle shared how the school she teaches at has over 270 employees, which made it difficult to call regular in-person meetings. Online groups had made life easier: *"The main objective of this group is to help us share information easily. Our community also isn't fond of meetings, so this group is a great solution. I check the group daily to see if there's someone delivering updates or if there's sad news like a death, and I respond accordingly. Being a member of the group has helped me stay informed and saves me time, as information comes to me without me having to go anywhere."* Rosa's experience, echoed by many of the teachers, further highlighted how such community groups, even when formed for one particular purpose, tended to greatly contribute to social cohesion and a sense of connection.

In Mekelle, higher education teachers engaged with specialised groups tailored to their fields of expertise. Tsega mentioned being a member of Telegram groups like "General Nursing and Midwifery" and "Hakim," which focus on sharing new information and staying updated on developments in healthcare education. Tirhas highlighted her participation in WhatsApp groups such as "Ayder Women Professionals" and Facebook groups like "Tslal Civil Service Tigray", where members shared skills, experiences, scholarship opportunities, and even organised movements for social causes.

Teachers with disabilities in both Addis Ababa and Mekelle had unique experiences with online communities, using the platforms for support, collaboration, and sharing information to address their specific needs. By providing a space where they could discuss challenges, share solutions, and access resources that may not be readily available elsewhere, teachers with disabilities shared how digital technologies have been crucial. For instance, Asnaqech, a visually impaired teacher from Addis Ababa, was an active member of a private Telegram group exclusively for blind teachers from different schools. She explained: *"We discuss different issues related to laws or new information regarding people with disabilities or teachers in general. We also discuss how we can solve personal issues that we may face."* This group had been instrumental in helping her navigate challenges as the only blind teacher at her school. Through discussions with other members, she had gained insights into solving personal problems and addressing professional barriers.

Beyond such online communities that facilitated professional development, the teachers also shared their experience with online communities created for social connection, including for parental support and religious groups.

Edir, the name for traditional community associations, are now among other social associations where communication is moving online. They now have group chats and channels where all types of information are disseminated. *"There is an Edir group on Telegram where we get information about meetings and we attend [in person] when needed,"* said Asefu from Addis Ababa. This real-time communication through online channels enabled quicker and efficient information flow regarding issues their *Edir* deals with – whether social affairs such as funerals or members' financial contributions. In-person meetings only happened when necessary.

Similarly, Bezawit, a teacher with a disability from Addis Ababa, shared how she was part of a “music lovers” Telegram group: *"There is also another group for music lovers; I love listening to music and this group not only shares music, but they also share different facts and information about the artists as well."*

These diverse uses of Telegram groups by the teachers were broadly captured by Bizunesh's experience, where the multiple online groups teachers were part of served multifaceted functions:

I use Telegram groups to interact with my students and also another group which is only for teachers. Moreover, I attended a boarding school in Shashemene, and the alumni there have created a Telegram group that is still very active. They have also helped me learn more about digital technologies. There is also a Blind Women's Forum, which is a Telegram channel only for blind women, where we can interact with each other. Most of our interactions as blind people are through Telegram. There is the Belay Zeleke group with all the teachers, and there is also the Edir channel... Whenever the Edir wants to call a meeting or share an important update, they use the Telegram channel. There is also this business-related Telegram channel called “Metowochu”. I do interact with all these groups, even though I may not post on them, I make sure to follow up. The benefits I can mention from being a member in these groups include opportunities where I get the right and timely information... and it also helps me interact with people that are very smart and have bright ideas that also inspire me.

These online communities not only facilitated the exchange of professional resources – such as teaching materials or job postings – but also provided opportunities networking and mutual support among educators. Bizunesh, who was from Addis Ababa, emphasised how these groups helped her interact with inspiring individuals who shared bright ideas while also providing timely information that prevented missed opportunities. Similarly, Birhan from Mekelle noted that these platforms reduced the need for in-person meetings by enabling efficient communication through videos and text documents, and using other digital resources.

6.3.3. Purposes of digital technology use

“...technology has transformed our work especially when it comes to connecting with students’ parents. For example, if a student didn’t do their homework before, we had to wait until they brought their family in. But now, we can easily call and update the student’s status. This is beneficial for students, teachers, and parents alike. There is also a group for our school. We share a lot of information in the Telegram group. Separate groups are created for KG, elementary, and high school.”

Rosa, a teacher from Mekelle shares how technology has transformed their teaching and communication experience

most often, as most people in her circle used it, and it made keeping in touch and communication easier. Moreover, Facebook was the most preferred social media platform for both communication and staying in touch with family and friends.

Enhancing teaching and learning through gathering information for research and work-related tasks was another frequently mentioned purpose of digital technology use. Teachers used their phones to browse different topics related to news and educational content. Bizunesh, a 43-year-old teacher with visual impairment in Addis Ababa, shared how having a phone had made some everyday teaching tasks easier: “...for example, I record my mark list, print it out, and also prepare exam questions using my mobile phone.” In some cases, teachers

who didn’t own smartphones, like Abrehet, a 55-year-old teacher from Mekelle, accessed the internet through the help of their children. When asked if digital technologies had transformed her teaching, Abrehet said: “Yes, of course. For example, we have a teacher guide, but instead of looking at that document, I could easily Google and find the answer online. I could quickly search and find the information in alphabetical order on the internet.” Focus group discussions also reflected a similar outlook. These experiences show how digital technologies were increasingly woven into everyday teaching practices and enhanced students learning experience. At the same time, they underscored how limited access could risk deepening existing digital divides among educators.

The most recurring themes that emerged with respect to the everyday use of digital technologies were using devices for communication in personal and professional lives, for teaching and learning, and for news and entertainment.

Communication in personal and professional lives was the most prominent everyday use of digital technology in teachers’ lives – both for personal and professional purposes. In addition to direct calls and SMS, communication was often channelled through various messaging apps, where Telegram was the most preferred application, followed by WhatsApp. Letebirhan from Mekelle shared how she used Telegram

“...technology has transformed our work especially when it comes to connecting with students’ parents. For example, if a student didn’t do their homework before, we had to wait until they brought their family in. But now, we can easily call and update the student’s status. This is beneficial for students, teachers, and parents alike. There is also a group for our school. We share a lot of information in the Telegram group. Separate groups are created for KG, elementary, and high school.”

Additionally, digital tools had streamlined administrative tasks such as recordkeeping or distributing exam questions digitally while enabling remote teaching during disruptions like COVID-19 or regional crises. Rahel, a private school teacher from Addis Ababa, bought her Samsung S21 smart phone when COVID-19 hit. She said: *“During COVID-time school was shut down and classes were being given online, so in order to send questions via Telegram it was necessary for me to have a smartphone”*

Access to **news and entertainment** was another common purpose of digital technology shared by teachers. Most respondents said Telegram, Facebook, TikTok, and YouTube were their preferred platforms for information and entertainment, as Neche from Mekelle shared: *“I use Telegram, IMO, and Facebook daily. My primary goal in using these applications is to stay informed about current events and the situation in my country.*

I also use social media to share information that I find important.”

“

...we use a software called JAWS to effectively use computers, and for our phones we use software called Talk Back... and for the Talk Back and the JAWS to also read Amharic alphabets, we pair it with MVDA... and we read PDF and other similar files through Adobe reader and WPS. We can even emboss that file into a hardcopy brail if need be!

”

A blind teacher from Addis Ababa explains the collective experience of using assistive technologies for blind people

Visually impaired teachers also shared the assistive technologies they rely on for daily work and communication. Among the most used was JAWS (for computers) and TalkBack (for phones), which convert texts into audio and make both teaching materials and personal messages more accessible. These tools were often paired with NonVisual Desktop Access (NVDA) to better support reading Amharic texts. Another application that was mentioned was Orbit Reader, which allows users to convert Braille into text and vice versa. Though not yet widely accessible, one participant also brought up OrCam MyEye, a newer, camera-based tool introduced through a government initiative, which is used to navigate surroundings within a 30-meter radius.

6.4. Socio-demographic dimensions

Occupation type strongly correlated with teachers' experiences of digital technologies. Teaching inherently requires constant communication – with colleagues, students, and parents – as well as managing data digitally, preparing lessons, and adapting to evolving educational demands. These job requirements created a continuous need to engage with digital tools, driving both adoption and integration into daily practice. This pattern held across teachers in Addis Ababa and Mekelle, where reliance on digital technologies was woven into their professional routines and grew over time, reinforcing skills development and confidence.

Disability status, particularly visual impairment, also showed a distinct correlation with digital engagement but in a more complex, intersectional way. For visually impaired teachers, adoption was often needs-driven where digital tools like recording devices, accessible apps, and online communities enhanced their independence and reduced reliance on others. However, this adoption did not always translate into equal

outcomes. Because many platforms were not designed with accessibility in mind, visually impaired teachers faced systemic barriers that prevented them from fully utilising the same tools as their peers. Here, disability drove adoption while simultaneously constraining the benefits derived from it.

Income and economic status correlated directly with the accessibility of devices and the quality of engagement. While most teachers reported owning multiple devices, many emphasised that these devices were outdated, limiting their ability to use advanced applications or keep up with evolving digital practices. Some teachers still lacked personal access to smart devices altogether and relied on borrowing from friends or family. Their income, described as disproportionate to the cost of newer technologies, shaped not only what they could use but also how consistently and effectively they could integrate these tools into their work and lives.

Geographical location further shaped the digital experiences of teachers by determining the stability of the infrastructure they relied on. Teachers in both Addis Ababa and Mekelle reported challenges such as frequent power cuts, unstable networks, and blind spots, which often disrupted their ability to connect or use online resources. These issues were compounded when combined with income constraints, as many could not afford alternatives such as private Wi-Fi or backup power solutions. The situation in Mekelle had been particularly severe: the recent conflict destroyed key infrastructural amenities and disrupted the relative economic stability, leading to prolonged outages and changed spending priorities. This disruption and consequent instability caused by the two-year war translated into a significant gap in the technological landscape where teachers were excluded from new technologies and opportunities, including institutional and national programmes.

Digital literacy emerged as a cross-cutting factor that amplified or restricted the impact of all other variables. Teachers repeatedly linked their confidence and ability to benefit from digital technologies to literacy acquired through training or self-learning. Higher literacy enabled users to explore new tools, troubleshoot problems, and adapt quickly, while lower literacy reinforced reliance on others or limited engagement to basic functions.

Taken together, these factors did not operate in isolation. They intersected to shape adoption, usage, and outcomes: occupation created baseline exposure, disability modified both motivation and barriers, income affected the tools available, geographical context determined infrastructural reliability, and literacy dictated how far users could go with what they have. These reflected patterns seen in previous studies, which showed that the availability of technology and infrastructure alone did not guarantee positive outcomes. Rather, these outcomes were mediated by social, economic, and contextual circumstances such as those described above.

6.5. Lived outcomes of digital technology usage

While most of the teachers associated the use of digital technology with positive outcomes, some also highlighted negative outcomes.

6.5.1. Positive outcomes

Easier access to teaching and learning resources was one of the most frequently mentioned outcomes. Teachers reported using platforms like Google and YouTube to prepare lessons, clarify concepts, and stay informed about their subject areas. This not only helped them improve their own knowledge and teaching strategies but also enhanced the learning experience for their students. As Zafu from Mekelle put it, *"we are teaching students to give them the lesson in an understandable way; you can use the internet to adopt different ways of teaching..."* This ease of access also extended to addressing resource scarcity, where hardcopy teaching materials were not easily available. In such cases, teachers shared how they use external hard drives, such as USBs, to store and share materials or shared them using emails or other platforms (e.g. Telegram). Tsigereda from Addis Ababa shared the following: *"I remember two or three years ago when the curriculum was changed; we couldn't access hard copy teaching books since it was not printed out and made available for sale by the Ministry of Education; and so we downloaded all the books and used that to teach our students and also our kids at home."*

In addition to resource sharing between educators and students, teachers noted how access to technology had transformed how students navigate their studies. Etenesh from Addis Ababa explained how access to different online resources catered to the different learning styles of students, saying that *"being able to leave the class and find YouTube videos and other virtual learning platforms to develop their know-how"* was a notable positive outcome. Teachers from Mekelle agreed. However, one teacher underlined the need for parental supervision as she had witnessed the students' tendency to waste their time navigating *"TikTok rather than focusing on their studies"*.

Visually impaired teachers also emphasised how digital tools had improved access by enabling the conversion of texts to audio and vice versa, making learning materials more accessible than before. Being able to do these tasks independently was repeatedly highlighted as a benefit. Hareg from Addis Ababa remembered the time she had to rely on her friends when she was a student and said how that has completely changed: *"It was very hard to learn for me back in the day – my friends had to record texts for me to read; but now I would only need to ask for a soft copy and just turn that into an audio which is a very big transformation. These things have very much helped me in my life and made everything easier."* Beza from Addis Ababa added how they could now easily convert PDF files into brail, which made different resources accessible.

Other teachers reflected on their own school experiences from when they were students to highlight how the internet and digital technologies had transformed the teaching and learning experience. Rahel, a private school teacher from Addis Ababa, shared: *"For example, access to information with regards to science when I was a student and the access now is very much different, new and improved. Digital technology has helped me to access different resources to enhance my knowledge in areas I didn't even fully understand when I was a student."* This highlighted how the internet helped teachers revisit topics they hadn't fully grasped during university, mostly due to limited access to supplementary learning materials at the time. This suggested how teachers and students could now explore different learning and teaching resources that suited their styles, with broader and more flexible access to resources.

Improved communication and social connection were recurring positive outcomes teachers associated with digital technology, as a more efficient and less costly use of messaging apps and group chats had removed the need to travel, pay for phone calls, or rely on others for everyday tasks. Mobile phones and messaging apps like Telegram and WhatsApp had made it easier to access real-time information and updates as well as communicate

with students, parents, colleagues, and even family and friends abroad. These platforms also allowed teachers to access job-relevant information, including school announcements and new course materials.

Teachers also shared how their ability to easily and directly communicate with parents through dedicated online groups – mostly Telegram – or through calls was a crucial feature. This was described as an unexpected but welcome outcome by teachers from Mekelle, who greatly appreciated the direct access they had to students' parents. *"If there is any kind of issue with a student, or if a student gets sick, we can call their parents and have them come to the school quickly,"* Kindihafti, a government teacher from Mekelle, noted. Similarly, Rosa shared how both the internet and phone calls, depending on the level of access parents had to technologies, was crucial: *"For parents who use mobile phones and the internet, we update them on the students' status daily. For elderly parents who don't use the internet, we call them directly."* Moreover, the school Rosa taught at, a charity school mainly for former military personnel in Tigray, offered teachers an ETB 200 (USD 1.5) mobile card monthly for these tasks. While this was not sufficient for all the activities teachers carried out throughout the month, it demonstrated how institutions can play a key role in championing the use of digital technologies in everyday teaching practice.

“...technology has transformed our work especially when it comes to connecting with students' parents. For example, if a student didn't do their homework before, we had to wait until they brought their family in. But now, we can easily call and update the student's status. This is beneficial for students, teachers, and parents alike. There is also a group for our school. We share a lot of information in the Telegram group. Separate groups are created for KG, elementary, and high school.”

Rosa, a teacher from Mekelle shares how technology has transformed their teaching and communication experience.

Increased efficiency and convenience in work was another commonly identified positive outcome. Teachers described how digital tools had led to a reduced burden of manual tasks like writing notes, preparing exams, and recording marks on paper. Many now used their phones, and for some, laptops and PCs, to create, edit, and share documents digitally.

In addition to the convenience of accessing resources and communication, some teachers, especially from Mekelle, shared how virtual classrooms were instrumental in allowing both teachers and students to teach and learn remotely when in-person classes were difficult. This included during the COVID-19 pandemic and when teachers were in remote areas for several reasons. Mekelle's focus group participants also shared how this had particularly been useful for female teachers on maternity leave: *"...and for women during maternity, including pregnancy and post-delivery, it allows them to stay productive without overexerting themselves."*

In unique contexts like the Tigray region, which saw a two-year-long deadly war that destroyed several institutions and infrastructure, teachers mentioned how they were able to retain students' grades despite the physical destruction of Adigrat University during the war.

Personal growth and professional development were the other commonly mentioned positive outcomes of digital technology use. Teachers described how technologies gave them access to various online resources and networks, which in turn improved their knowledge, skills, and general awareness of the world. Online groups for teachers, mothers, or people with disabilities were also valued as spaces for support and community. Lewetnesh, a government school teacher from Mekelle, noted how the different professional networks she had made through platforms like WhatsApp, Telegram, and LinkedIn gave her access to information related to webinars, scholarships, and other similar professional development opportunities, which she believed she wouldn't have had access to if she didn't have access to digital technologies.

Other positive outcomes most teachers indicated included the ease of financial transactions and access to entertainment content across different social media and streaming platforms. The use of mobile banking for different transactions was quite common among most teachers, regardless of the type of phone they owned. This convenience mainly helped to save time that they would otherwise have to spend traveling to the bank to make transfers or make purchases. Instead, teachers now used different mobile banking and money platforms, such as Telebirr.

Some also said how easy access to spiritual and religious content, such as a Bible application and spiritual songs and videos, had added significant value to what matters to them most. Simirt from Addis Ababa shared how she engaged more with *“posts from [her] church’s spiritual channel than the school group”*. *“I share and like them with my friends, which helps me spread the content quickly,”* she said. One participant admitted she would miss her religious videos and songs the most if she lost her phone.

6.5.2. Facilitators of positive outcomes

The **accessibility and affordability** of digital technologies emerged as one of the key enablers of the positive outcomes shared by teachers. While not universal, there was an increasing range of device options at varying prices – particularly mobile phones – that allowed most teachers to access the internet and use digital tools for daily needs. Expanding internet connectivity and improved services, including home Wi-Fi and lower data costs, had also made it easier for most teachers to engage with digital platforms more regularly.

Digital literacy and technical skills were also indicated as common facilitators for positive outcomes. These included possessing the necessary technical knowledge and skills to use devices, applications, and software. The teachers also shared how this learning process took place mostly through trial and error, observation, and peer or family support. For instance, Desta from Mekelle shared how she learned how to navigate her phone and applications by searching online and occasionally asking others for help. On the other hand, Metasebia from Addis Ababa shared how she learned on her own with occasional support from her father. Asnaqetch, a teacher with a disability from Addis Ababa,

“

My technical knowledge and my financial ability to afford internet access and a digital mobile phone have helped me use digital technology to make my life easier... it helps me get updated information promptly, whether it's educational or health-related.

”

Haymanot, a teacher from Mekelle, shares the multiple factors that facilitate the positive outcomes of digital technology in her life

was supported by peers with similar disabilities. She said: *"There were our seniors like Yetneberesh. She is my biggest role model, and she was the one who taught me how to use that phone."*

Personal motivation and interest also played a crucial role in leading to positive outcomes. These were seen in most teachers' eagerness to learn and achieve their personal goals, such as the need to stay updated about current issues, enhance their professional capacity as teachers, and improve the quality of their personal lives through access to information. Asnaqech from Addis Ababa shared the following: *"More than anything, I believe my eagerness to know about digital technologies played a great role... and this eagerness to know helped to solve my biggest challenges while I was in university, which was being able to find people that would read notes and read exams for me."* This personal motivation, as a result, led Asnaqech not only to be relatively independent in her studies but also saved costs she would otherwise have incurred paying those who read notes aloud for her.

Support from peers and family was another key factor in facilitating positive outcomes. Simret, a teacher from Addis Ababa, explained: *"I didn't have a strong understanding of digital technologies at first, but my friends and family taught me..."*. Haymanot from Mekelle had a similar experience of receiving reliable support from her friends and colleagues: *"My friends and colleagues help me by sharing important information. When I'm buying [gadgets], they come with me, especially those who are knowledgeable about technology. They also help me learn how to use these technologies. We help each other out; it's not good to go it alone or only rely on what you already know."*

For teachers with visual impairments, organisations such as the Ethiopian Women with Disability Network and *Ayneseweran Mahber* offered training and **support networks** that made technology use more accessible. In addition, the growing availability of assistive technologies had enabled blind teachers with greater independence in accessing information and carrying out teaching duties.

More broadly, the increasing digitalisation of society itself continues to act as a strong push factor for adopting digital tools in everyday life.

6.5.3. Barriers to positive outcomes

Economic constraints were the most frequently mentioned barriers to digital technology access. Teachers in both cities pointed to the high cost of smartphones, laptops, and related devices as a major limitation. Tsigereda from Addis Ababa explained: *"Smartphones and laptops are not easily accessible from the perspective of our country's economy. For instance, if you buy a phone costing less than 10 000 Birr, it may not function properly... The main reason for this lack of accessibility is income."* Although Ethiopia has relatively low data prices, many teachers noted that the cost was still high compared to their income, restricting their use of mobile data. Similar concerns were raised in both focus group discussions, where participants emphasised how constrained access to technology results in serious disparities. One teacher said: *"I know fellow teachers who struggle to have smartphones and therefore are not able to access the school's Telegram group and they get in much trouble because they miss out on information forwarded by the school."*

For visually impaired teachers, the cost of assistive technologies added another layer of financial difficulty. Several teachers expressed a desire to upgrade their devices but found that the gap between income and technology cost remained a significant hurdle. Zafu from Mekelle shared her experience: *"The*

economic constraint is the main issue. Directly or indirectly, it affects us in many ways... At this time, like Messenger, I think there is an updated version...but I cannot install it since my phone's Messenger is not working."

Lack of reliable infrastructure, especially associated with frequent interruption of electricity even in urban areas, was a disruptive factor to device usage and internet connectivity. While poor and unreliable internet connection was a recurring problem in both cities, Mekelle had been most affected due to the recent conflict in Tigray, which saw months of telecommunication serviced shutdown. A focus group participant explained: *"In Tigray, the crisis, siege, and blockade caused significant disruptions, including internet outages. Following that, there has been a severe economic crisis and security challenges. Even traveling with mobile phones or laptops is not safe."*

Limited digital literacy and skills were frequently mentioned as barriers to positive outcomes. Many teachers said they relied on trial and error rather than formal training. Getenesh from Addis Ababa said: *"I haven't taken any digital literacy training, but I learned how to use technology through trial and error, starting from my feature phone."* The limited support they received from their institutions and communities hasn't kept pace with fast-changing digital tools. This gap was even more pronounced for visually impaired teachers who often lacked guidance to use assistive technologies or new platforms like AI tools fully.

Limited institutional and community support – especially in terms of training and access to up-to-date devices – was raised as another challenge. As one focus group participant from Mekelle underlined, institutional support must go beyond providing equipment: *"While there is Wi-Fi, computers, and a projector, these resources are just in the initial stages and are not sufficient."* A lack of proper support from institutions that facilitated capacity development programmes was also emphasised by teachers with visual impairments, who sometimes felt that the trainers and workshops were not well prepared to cater for teachers with disabilities. One visually impaired focus group participant from Addis Ababa expresses this sentiment: *"Even when training is provided, the institution must ensure that trainers are well-equipped and base the training on a needs assessment of the teachers. I attended training for teachers with disabilities, but it was ineffective because the trainers did not know how to teach us properly."*

Concerns around misinformation, polarised ideas, and harmful content on social media were also raised as barriers that made teachers more hesitant to engage with certain platforms fully. As Metasebia noted: *"If you have observed the current state of social media in our country, it's very confusing and the ideas are very polarised... Unless you know how to filter what you consume on social media, both sides can be damaging."*

Fear of making mistakes and damaging devices was also raised during the focus group discussion in Mekelle. This contributed to their reluctance to use advanced technologies and a preference for sticking to pen and paper. This hesitation was closely tied to the limited support available for building technological capacity. The result was that teachers often lacked confidence to learn through trial and error.

Discomfort around using Wi-Fi in public spaces was mentioned as a commonplace among teachers with disabilities. Tsega, a visually impaired teacher in Mekelle, said: *"They avoid going to hotels or restaurants with Wi-Fi because they feel that disabled people don't belong there, and they end up looking down on themselves."* This fear of experiencing discrimination due to their disability led to limited access to Wi-Fi services, which were essential to access certain platforms and content, and affected networking opportunities.

Inaccessible digital payment platforms were also problem for teachers with disabilities. While most teachers without visual impairments spoke about impulsive spending – often linked to the convenience of online banking and mobile money – teachers with visual impairments did not fully relate to this as they experienced many digital payment platforms as being inaccessible, which made everyday tasks harder for blind teachers and limited their independence.

Software compatibility issues were also flagged by teachers with visual impairments. Bezawit from Addis Ababa highlighted the following: *"There is this software called JOS, which blind people make use of. There may be incompatible versions of this software for my PC. Since my PC is outdated, it doesn't support the latest version of the JOS software, so I try to find the version that is most compatible with my digital tool so that it is accessible to me."*

Additionally, poor internet access was a major barrier, especially because moving around in search of a better connection wasn't always convenient or feasible for people with disabilities.

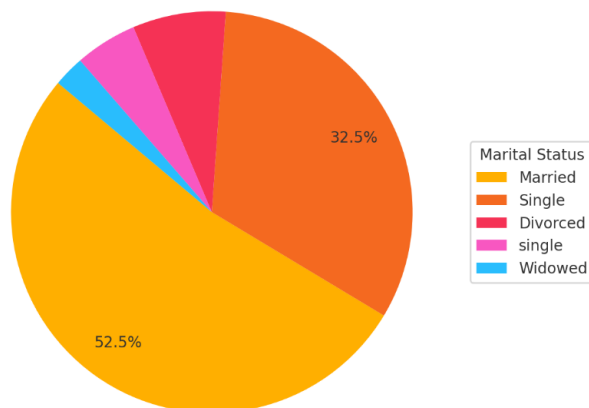
6.5.4. Negative outcomes and contributors

Distraction and time wastage were frequently cited as negative outcomes of digital technology use. The teachers noted how platforms like Facebook and TikTok could easily lead to procrastination, with attention drifting away from work-related activities and what they considered meaningful tasks. More notably, teachers pointed to the excessive use of social media by their students. Getenesh said: *"The negative effect is that TikTok consumes much time... I often wish this app disappears because I am worried it takes away from their study time"*. Some also reported that excessive screen time contributed to feelings of isolation and loneliness, highlighting how tech use can sometimes replace human interaction rather than facilitate it.

Concerning excessive screen time, some also noted **physical health issues** due to prolonged phone and computer use, such as headaches and eye strain. Haymanot from Mekelle shared how she avoided using mobile phones for extended periods to avoid this: *"I also avoid using my mobile phone for extended periods due to concerns about its effect on my eyes. I only use it for important matters, such as educational or health information, or for looking up recipes. I'm selective about what I choose to look at online."*

Figure 8: Marital status distribution of teachers

Marital Status Distribution of Teachers



For teachers with visual impairments, **overuse of earphones** was in particular raised as a physical health hazard, as they often relied on earphones to make use of screen readers like JAWS or TalkBack, especially in public spaces. Bizunesh identified this as a major negative outcome while also noting the importance of using everything in moderation: *"The major culprit to the negative outcome I have identified is having ear problems from over usage of earphones... However, everything has its negative side unless we learn how to use it wisely."*

Impulsive spending was also associated with the ease of digital payments; while they are convenient and useful, they could equally result in losing track of

money. *"You may spend more money because it is easier to pay now that everything is digitalised, which influences your eagerness to spend an unnecessary amount of money"*, said Alem, a teacher from Addis Ababa, underlining how the ease of financial transaction had its caveat.

6.5.5. Gendered outcomes and barriers

Despite several mentions of gendered barriers for women, some answers participants gave were far from uniform. In several cases, teachers did not feel that there were any gendered factors where women have a systemic and structural disadvantage compared to men. While some respondents simply did not see any gendered barriers at all, longer responses by others sometimes revealed otherwise. For instance, Birikti from Mekelle led with *"I wouldn't say being female is a barrier in itself, because women work equally with men in many sectors,"* but then added how domestic responsibilities women bore put them at a disadvantage: *"As a woman, you can't always work as much as you'd like, unlike men, because you have these additional responsibilities. Men can often work more and earn more money, while we use our free time to care for our children. This means we can't buy digital technologies as easily; we invest more in our homes than in our professional lives, and this is a major obstacle."* What Birikti described here was essentially **domestic gender roles and unpaid care work responsibilities** that resulted in time poverty among women with family and household responsibilities.

The focus group discussions in both cities revealed more nuances around this correlation between domestic responsibilities and the use of digital technologies. In Addis Ababa, all participants disagreed with Beza who believed men had more patience and will than women to learn new things. As she put it, *"that is just how we are naturally."* The disagreement by other participants was rooted in evaluating their everyday life, where they emphasised that women were behind in learning and exploring new things, mainly because they did not have enough time and mental capacity compared to men. As countered by another participant: *"I don't believe this is because of a natural difference. To be patient and fully concentrate on learning new things and exploring digital technologies, I would first need to have a stable mindset and a worry-free mind. However, that is not the*

case for many women because we are overloaded with responsibilities." This was supported by other participants who agreed, one saying: *"A typical man would go home from work. He will either be on his phone or computer doing something."* Another participant noted: *"Men spend most of their time outside. Either they are at work, or with their friends, or ... enjoying their hobbies. Thus, throughout this, they will get to interact with digital technologies and have conversations with other people ...but most women do not have this same exposure."* Focus group discussions in Mekelle supported these reflections by teachers in Addis Ababa. Some shared how men could access public Wi-Fi spaces outside working hours, but women did not have the same luxury. This was mainly noted as a cultural and social expectation of women to primarily focus on their household responsibilities, especially if they were married. One participant further noted how female teachers managed to explore digital technologies on their own or with colleagues during free periods or break time at school. However, they could not extend this practice after working hours as they were, as one participant said, *"expected to take care of [their] children and handle household chores."* *"Taking time away from these responsibilities to engage with technology is unacceptable in the community,"* she added.

Discriminatory gendered expectations also came out as factors that shaped women's experiences with digital tools. Some expressed fear of being perceived as rude if they used a digital device in front of others, and fear of being criticised for doing certain activities, such as online business. Letebirhan from Mekelle shared this fear of being judged by others, as she has noticed other women being unfairly criticised for attempting to do online work. Similarly, the focus group in Mekelle revealed how women avoided using Wi-Fi in public spaces, such as hotels, for fear of being perceived as seeking attention. Tsigereda from Addis Ababa also noted how girls compared to boys were unfairly restricted from navigating digital technologies as they wished due to the perception that girls were more prone to chatting with boys than using these tools for educational purposes. These concerns were rooted in their observation of how other women who engaged in such activities were perceived in their communities, leading to self-policing and internal doubt about whether their online presence was appropriate as a woman. Tsigereda said she tried to be careful about how she let her daughter use the internet: *"I don't like it when she spends too much time on her phone. However, I allow her to use the laptop that her uncle sent for her whenever she wants. This perspective comes from family and society, as we have a belief that phones are not good."*

Gender-based online harassment and unwanted attention from men were also raised as concerns. Teachers described encountering such instances that made them cautious or even pushed them away from certain platforms altogether. Tirhas from Mekelle shared how she sometimes received unwanted photos and was met with insults when she ignored men: *"If they message me and I don't reply because I don't want to, they insult me and send inappropriate pictures. They say things like, 'You girls are nothing and cheap.'" Such experiences revealed how digital spaces, even when ignored, remained unfavourable for women, discouraging them from navigating spaces freely. Other participants like Serkalem and Lelise shared similar encounters, which they described as getting "unwanted messages" or "being approached by men you do not want". Sometimes, the graphic nature of these harassments had a long impact on women. One participant shared the following: "I'm still upset about a particularly offensive image I saw that demeaned women. It was a picture [...] implying that men control women and can be treated however they like."*

6.5.6. Challenges of teachers in conflict contexts

The war in Tigray has had a profound impact on teachers' use of digital technologies, creating both significant barriers and moments of resilience. The conflict led to widespread disruptions in infrastructure, with extended internet outages and electricity interruptions making it difficult for teachers to access online resources or participate in digital training. As one participant explained during the focus group discussion: *"In Tigray, the crisis, siege, and blockade caused significant disruptions, including internet outages. Following that, there has been a severe economic crisis and security challenges. Even traveling with mobile phones or laptops is not safe."* Economic hardship further compounded these issues as the cost of devices soared and many teachers struggled to afford essential tools.

Teachers also highlighted psychological impacts and called for mental health support: *"In Tigray, we are facing a crisis, so mental and psychosocial rehabilitation is essential."* Overall, while digital tools provided critical support where possible – such as maintaining communication or safeguarding academic records – the war left many teachers feeling technologically excluded compared to other regions in Ethiopia.

Despite these challenges, some positive outcomes emerged due to the necessity of adapting during the conflict. For example, as highlighted earlier, digital technology enabled the preservation of important records: *"Despite the destruction of the university during the war, students' grades were not lost, thanks to digital technology."* However, established practices such as students using tablets for learning were disrupted: *"Before the war, students used tablets for learning, but the war disrupted this, and participants noted a loss of familiarity with the tablets due to a lack of training."*

6.5.7. Conclusion

The experiences of teachers in Addis Ababa and Mekelle demonstrated that digital technologies had become an indispensable component of modern teaching and personal development. Yet its benefits were distributed unevenly among educators. The findings painted a picture of teachers who were eager to harness digital tools to enhance their professional practice and daily lives, while contending with a host of structural constraints that tempered this enthusiasm. In both urban centres, teachers envisioned technology as a catalyst for educational quality and efficiency – a vision only partially realised given the realities on the ground.

Teachers' digital realities were marked by clear improvements in access to knowledge and efficiency in their work. Across subjects and grade levels, educators reported using the internet and devices to prepare lessons, find supplementary materials, and stay updated with new information. Communication had similarly been revolutionised: messaging apps and social media groups enabled quick coordination with colleagues, prompt updates from school leadership, and easier outreach to students and parents. The net effect was that digital tools, where available and understood, were helping teachers become more effective educators and more informed professionals.

Beyond classroom instruction, technology had spurred significant personal and professional growth among the teachers in the study. The convenience introduced by digital tools extended to everyday tasks: educators highlighted the ease of conducting financial transactions online, accessing entertainment and news, and even finding spiritual nourishment through apps and videos. These varied uses underlined how intertwined

technology had become with teachers' identities not just as instructors, but also as learners, parents, and community members seeking information and connection.

The positive outcomes observed were rooted not only in the technology itself but also in teachers' own initiative and support networks. This spoke to a strong personal motivation among teachers to stay current and improve their craft, even if structured support was lacking. Likewise, collegial support and knowledge-sharing played an instrumental role. Teachers often turned to friends or colleagues for help troubleshooting tech problems or learning about new educational apps, creating informal communities of practice. These dynamics illustrated that when the environment was enabling – through accessible infrastructure, peer mentorship, or institutional encouragement – teachers could rapidly amplify the impact of digital access on their teaching outcomes.

At the same time, pronounced structural barriers continued to impede teachers' full digital inclusion. Economic limitations were a recurring theme, with many educators unable to afford up-to-date smartphones or laptops that would make digital teaching easier. The cost of connectivity, despite being lower than the regional average, still strained teachers' budgets, leading some to limit their use of mobile data or forgo certain online activities. This financial hurdle was even higher for teachers with disabilities who required assistive technologies. Infrastructure challenges further complicated their efforts: unreliable electricity and patchy internet service were commonly cited, meaning even those with devices and know-how could not depend on a stable connection when they needed it. These factors posed a risk of stalling the progress of digital integration in teaching for a prolonged period. These structural deficits underscored a sobering reality: no matter how motivated teachers were, uneven access to infrastructure and affordable technology dramatically curtailed the consistency and depth of their digital engagement.

The study revealed that female teachers often juggled heavy domestic responsibilities alongside their teaching duties – a dual burden that left them with fewer hours and less energy to spend on honing digital skills or exploring new tech tools. This gendered time poverty meant that even when resources were available, women may still lag in digital engagement. Some had encountered sexist or derogatory remarks online – a gender-based online harassment that their male colleagues experienced far less frequently. There was also a lingering societal scepticism in some communities about women's public engagement online. As a result, women educators may self-censor or withdraw from potentially enriching online discussions and opportunities. In essence, simply providing technology would not guarantee equal digital empowerment for all teachers without addressing the social expectations and safety issues that disproportionately affected women.

Disability and conflict introduced additional complexities to teachers' digital lives, highlighting both the transformative power of technology and the fragility of access. Teachers with visual impairments in Addis Ababa and Mekelle shared how smartphones equipped with screen readers and other assistive software have fundamentally improved their independence in both teaching and daily tasks. However, their stories also highlighted how fragile these gains could be; if software updates lagged or devices became too costly to replace, visually impaired teachers could quickly find themselves sidelined from the digital arena despite their skills, while teachers in conflict areas found themselves grappling with the aftermath of devastating war that destroyed infrastructure and caused their students to regress. These narratives underscored that factors like

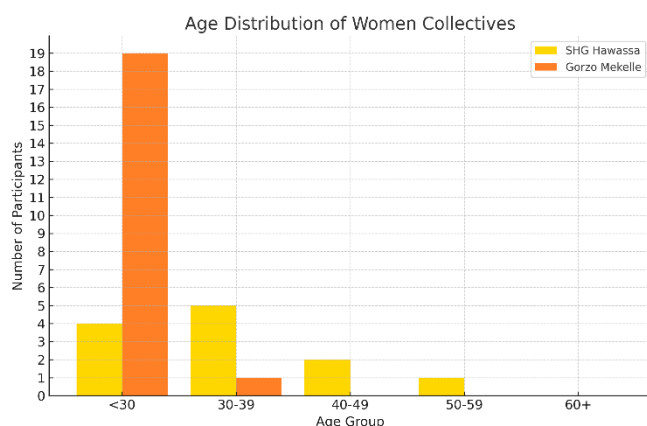
political stability, peace, and specialised support for people with disabilities were integral to the story of digital inclusion – technology’s benefits were always contingent on a broader enabling environment.

7. Women collectives

7.1. Women’s collectives’ context and population profile

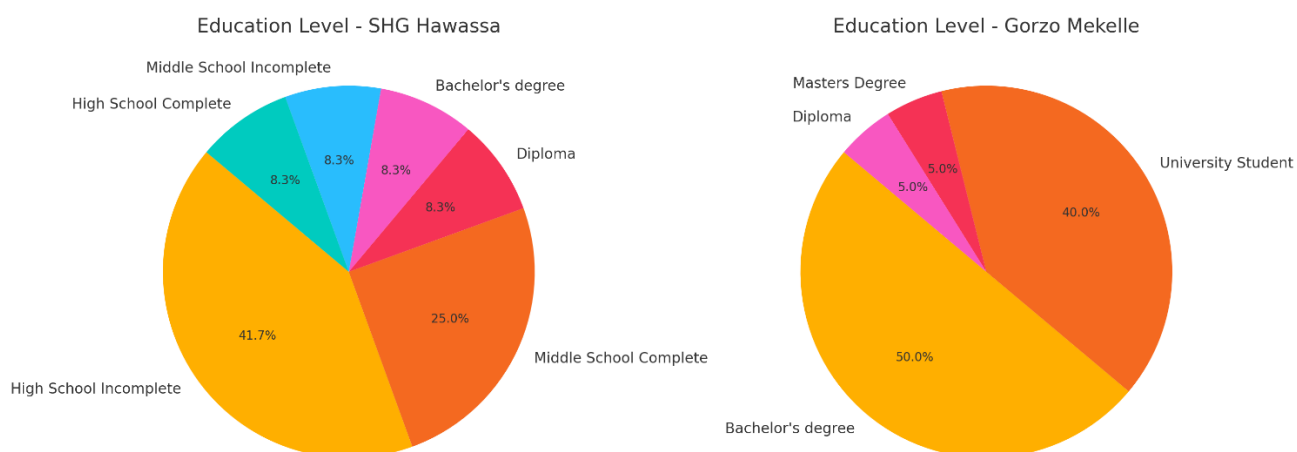
Two different women's collectives from Mekelle and Hawassa were selected to participate in this study. *Gorzo*, the collective from Mekelle, is a young women's group that advocates for women's rights in the region. In Hawassa, women from two different collectives – *Mignote Molla* and *Serten Enedeg* – under a regional SHG structure were selected; both collectives were focused on supporting women in micro-businesses and creating space to address several social issues that affected women.

Figure 9: Age distribution of women



There was generally a stark difference between the collectives, especially in terms of generational gap and educational background. Almost all Gorzo members who participated in the research ranged from 23 to 33 years old, with a median age of 25, while the SHG members ranged between 23 and 50 years old, with a median age of 30. However, the accuracy of some SHG members' reported age was uncertain. Hawassa has long been home to economic migrants from the southern region and

surrounding rural areas, where formal birth documentation was limited, meaning many older members may not know their exact year of birth. As a result, formal identifications may often reflect estimated ages. This was evident in cases where reported ages did not align with life histories; for instance, one participant who reported being 28 years old also shared having two children, 15 years of microbusiness experience, and obtaining her first phone in 2006, suggesting she was likely older. Such inconsistencies were observed among participants who reported to be in their late twenties and early thirties. Thus, the age-based comparative analysis in this section is framed broadly in terms of generational gaps rather than relying solely on reported ages.

Figure 10: Educational level of women

Regarding literacy level, 55% of Gorzo members had university degrees, while 40% were enrolled in universities, and the rest had a diploma. Conversely, only 16.6% of SHG members had a university degree and diploma, 33.3% completed high school and middle school, and the rest attended middle and high school but never completed their schooling. This educational difference significantly affected how collective members navigated digital technologies.

This contrast gave the findings more nuance, allowing exploration of differences in everyday technological use, professional use, and the broader adoption journey.

7.2. The digital journey of women collectives

7.2.1. Early beginnings: First devices

Among SHG members from Hawassa, most of whom were in their 30s, participants shared that their first phones were basic feature phones acquired in the early to mid-2000s. On the other hand, Gorzo members – and the younger members of SHGs – who were mostly in their 20s, acquired their first devices within the past five to ten years, typically during elementary and high school. This pattern reflected not only broader technological shifts but also the stage of life at which members first encountered digital tools. Moreover, all 12 SHG members interviewed reported they started with feature phones, while 11 out of 20 Gorzo members reported they started with feature phones.

The learning process of using their phones reflected similar generational differences, where most of the SHG members learned from their husbands, children, and friends. In contrast, most Gorzo members were self-taught through self-directed learning and observing their parents. One SHG member in her 30s shared how she first learned from her husband, and then from her child: *"First, my husband showed me how to use it because he had a phone first, and I used to explore while he was charging it. I only knew how to answer a call. After that, my child, seeing how to use it from her friends, showed me how to use the phone more."* This was a similar response to most of the other SHG members who shared their stories. A 45-year-old member also remembered her learning process: *"The family member who gave me the phone taught me how to use it."*

Conversely, Gorzo members shared their learning experience as if it were natural and intuitive. A 26-year-old Gorzo member who occasionally worked as a social media manager said: *"It was not difficult. I'm not sure how, but I figured out how to use it. It's not something you actively learn."* Similarly, a 25-year-old member shared: *"I can't recall exactly how I learned to use it. I figured it out on my own. It wasn't complicated; it had familiar features like Facebook, games, and the ability to make phone calls. I don't remember if I had prior knowledge, but no one explicitly taught me."*

7.2.2. Transitioning to smartphones and devices

All collective members owned smartphones – from budget-friendly phones like Oppo to high-end smartphones like the iPhone. Predictably, due to the nature of their everyday needs, such as work and school, most Gorzo members had more than one technological device, while SHG members mostly relied on their phones only. Most members reported owning both phones and laptops, and some included tablets.

For most SHG members, mobile internet became accessible long after they owned their first phones. Even when it became available, many did not upgrade to smartphones immediately. In contrast, nine out of 20 Gorzo participants reported starting with smartphones, giving them instant internet access, while the rest accessed it through their parents' phones.

While differences in the timing of internet access could be partly attributed to infrastructural development and market availability of devices, which exposed the younger generation to more advanced systems, socio-economic factors also played a role. This could be seen in how they described their first learning experience that revealed an early access gap. Most Gorzo members reported early access to devices and internet through their parents, unlike younger SHG members, who reported more limited opportunities. Gorzo members frequently described learning from their parents and their siblings even before having access to their phones. One participant recalled: *"I learned by myself by observing them [the parents] when they were using it [their phones]. It was new, and it is known that you learn by yourself by taking the phone from your parents, so I think I taught myself how to use it when I was in Grade 4."*

This early exposure, particularly to smartphones during formative years, can significantly influence members' confidence, adoption, and the extent to which digital technologies become integrated into their everyday lives. For SHG members, their late adoption, coupled with a lower literacy rate, influenced their habits and limited their confidence. In contrast, Gorzo members' early adoption, coupled with their higher literacy rate, contributed to their confidence and tech savviness to explore a wider range of devices and internet services. In other words, earlier and longer exposure to digital technologies resulted in wider and more flexible use of tools, devices, and applications, leading to improved skills, confidence, and efficiency. In comparison, later and slower exposure limited these benefits.

7.2.3. Connection preference and cost

Women's collectives described different factors determining their internet connectivity, including cost, reliability, and household context. Many participants expressed a clear preference for Wi-Fi due to its relatively stable connection and affordability – especially when shared among family. As one Gorzo member explained: *"I use Wi-Fi internet because, in the house where I live, I can say mobile data does not work. We are obligated to buy Wi-Fi since mobile data did not work in our home"*. Another participant highlighted the practical benefits:

"I primarily use Wi-Fi for internet access, relying on mobile data only when necessary...I prefer Wi-Fi for communicating on social media platforms due to its stability, low cost, and the longer connection times it provides".

However, this preference was often constrained by financial realities. Members with lower income and more financial responsibilities faced greater challenges. For some SHG members in Hawassa, even modest spending on connectivity strained their budgets: *"I spend 500 ETB per month and it doesn't go well compared to my income since I have other [priorities] I must spend money on too"*. Others relied on family support or public hotspots; as one participant noted, *"Wi-Fi is free since my family covers it, but I spend up to 300 Birr [USD 2] for mobile data and it's proportional to my income"*. The burden was even heavier for those who must purchase daily packages: *"I don't have Wi-Fi at home, so I use publicly available Wi-Fi hotspots when I can find them... I spend about 100 Birr a day on mobile data. This is a significant expense, and honestly, it creates a negative balance in my budget"*.

The experiences revealed that while women collectives strived to maximise affordable options like shared home Wi-Fi or public hotspots whenever possible, high costs – especially among those reliant solely on mobile data – remained a significant barrier affecting their digital engagement and participation in online activities. The trade-offs between cost and connectivity underscored persistent inequalities in digital access across different regions and socio-economic backgrounds. Furthermore, the reliance on open public Wi-Fi made users more susceptible to cyber-attacks, including hacking, especially when compounded with lower digital literacy and poor online security practices.

7.2.4. Time and dependency

The collectives in both cities reported a wide range of daily internet uses, with the amount of time spent online closely linked to their professional roles, personal interests, and access. For some internet use was minimal – often less than an hour per day.

As one SHG member from Hawassa explained, *"if I don't have work to do or customers to talk to, I don't usually use my digital device or internet for that matter,"* while another noted only spending *"30-60 minutes"* on her phone. However, spending little time on phones did not mean that the women did not feel dependent on phones. For instance, one SHG member who said she doesn't spend that much time online also said: *"Anywhere I go, I have to have my phone in my hand because it's my way of communication and conducting work."* Similarly, when asked if she felt dependent on her phone, another member who claimed to spend only one hour online per day said: *"I think so. As I said before, a phone has become an accessory that one can't live without."*

Several members provided longer hour estimates depending on the nature of their everyday activities. One SHG member described her average daily usage, stating that *"it depends on my job condition but up to six or seven hours a day..."* and added that she considers herself dependent on her phone as she used it for work. Similarly, one Gorzo member shared how she spent the entire day on her devices and online: *"It would be a lot, pretty much most of my day...If I sleep for 7-8 hours...the rest of the time, I'm pretty much on my phone or laptop."* She further described what seemed like a high level of dependency: *"I'm very dependent on digital tools. I spend time with my friends and family in person, but honestly, the time I spend in the real world is less"*

than the time I spend in the digital world. My job is mostly digital, and even when I connect with my friends, it's usually through video calls or texts. So yeah, I rely a lot on technology." Interestingly, this level of online engagement was more pronounced among the younger generation in the collectives. This may correlate with the level of digital literacy facilitated by early exposure among younger members, in addition to an apparent economic affordance.

Overall, these patterns revealed that while some women in the collectives limited their digital engagement due to necessity or preference – and thus reported only moderate dependence – others integrated extensive online activity into both their professional routines and personal lives. For these participants, especially whose livelihoods or studies depended heavily on being online, digital technologies had become indispensable tools for communication but also platforms for learning, advocacy, business growth, and community building.

7.3. Everyday use and practices

7.3.1. Frequently used applications

Telegram and WhatsApp were the most used apps by both collectives for their professional and collective goals. For SHG members, Telegram groups and channels were instrumental in promoting their businesses and communicating with clients. One interview participant who had a clothing sales business was among the SHG members who utilised the locally popular Telegram group and channel functions: *"I mostly use Telegram because my customers are on Telegram, and I can easily upload the pictures."* Compared to Gorzo, SHG members did not use WhatsApp as much as Telegram. Gorzo members, on the other hand, used both Telegram and WhatsApp for their personal, professional, and collective communication. Most members shared how both their full-time jobs and personal everyday arrangements were coordinated via WhatsApp, which led them to use the application more frequently. One member highlighted how WhatsApp was predominantly used for her work: *"I check for updates and communicate with others through Telegram and WhatsApp, with WhatsApp being primarily used for work-related communication."* Another member also said how WhatsApp was the preferred communication medium for the collective: *"We [Gorzo] communicate with WhatsApp and sometimes with Telegram for transferring of files, but we use WhatsApp more frequently."*

The use of Facebook, TikTok, and Instagram followed closely, with at least two mentions from SHG members and nine mentions from Gorzo members. Most SHG members used these apps as a means to keep in touch with loved ones, while Gorzo members were more specific about what they did with them. For instance, one Gorzo member shared why she frequents these social media platforms: *"I use them for a few key reasons: First, I have my podcast, and I use these platforms for its promotion. Second, I use them for entertainment and to stay up to date on current events and trends."* Another added: *"TikTok is my source of entertainment, a place to unwind, but I also use it to check out advertised products and sometimes make purchases."*

While collective members used these social media platforms for personal purposes – such as keeping in touch with family and friends, getting information and news, and entertainment – some, particularly Gorzo, also used them to achieve the goals of the collective – public advocacy for gender equality in Tigray. One member described this use: *"We use platforms like Facebook, LinkedIn, TikTok, Instagram, and Telegram to write posts, comment, and carry out community outreach programmes."*

YouTube, although not as frequently mentioned as the others, still played a significant role, especially for Gorzo members, who used it for self-initiated professional development and entertainment. As one member shared: *"I also use YouTube to watch videos that help me with my work and other important things."*

Although mobile money and banking applications such as Telebirr and offered by the Commercial Bank of Ethiopia were not explicitly mentioned, respondents indicated how online banking has made business transactions and professional payments much easier than when they had to rely on physical banks. This was especially highlighted in the focus group discussion with SHG members. *"I have a banana fruit business, so whenever I buy fruits from a wholesaler, we perform the transaction through mobile banking, which makes the process so much easier,"* one participant said. Her fellow SHG members agreed and shared how mobile banking had made their business processes easier too. This indicated that, despite not being explicitly mentioned, collective members used these tools frequently both in their personal and professional lives.

Apps with extremely low counts – job-specific and more advanced tools associated with the activities of a collective – were mostly mentioned by Gorzo members. This was mainly due to both the nature of their jobs and educational levels that afforded them the literacy to navigate advanced tools. This could be seen in how some Gorzo members described their daily digital routines and the diversity of apps they worked with. One Gorzo member, a marketing professional and part-time language teacher, described her use: *"I use Google products like Google Slides, Google Docs, and Google Sheets, as well as PowerPoint documents and similar tools. I also rely on Gmail and webmail for communication."* Similarly, another member, a 25-year-old freelancer in the filmmaking industry, said: *"Most of our [work] communication is digital, primarily through WhatsApp and email. We also use group collaboration platforms like MIRO."*

Overall, these uses of diverse apps, frequencies, and purposes were illustrative of the role digital technologies played in shaping the personal and professional lives of women. Additionally, their utility in achieving the goals of collectives, such as in the case of Gorzo, further influenced their adoption and usage habits. This could be seen in how, for instance, SHG members felt that doing business had become more efficient following their ability to promote their products and transact payments digitally. Gorzo members were able to access online courses that enabled them to get better or different jobs.

Nonetheless, the way the two collectives used applications and the internet had a stark difference. As highlighted above, SHG members' use of applications was limited to messaging apps, social media, and mobile banking, while Gorzo members engaged with a broader range of more advanced apps. Such disparities were associated with educational level and time poverty: the lower the educational level, the fewer the chances of exploring more advanced apps; and the less time they had to learn and explore digital technologies, the slower their adoption rate. On the other hand, Gorzo members' higher education level, coupled with the generational gap and their early exposure, afforded them better skills and confidence to explore new applications. These patterns underscored not only what apps were most frequently used but also why usage habits differed due to socio-economic and generational factors.

7.3.2. Online communities

Online communities played a key role in the lives of women collective members, especially for those who had a more advanced and dynamic use of technology. The focus of these communities ranged from spiritual, parenting, professional, and personal development issues, to activism, and neighbourhood safety.

SHG members' engagement with online communities mostly gravitated towards groups that enhanced social and spiritual ties. One SHG member, a mother of two, was part of *"a group about women and children"* and another group about *"youth camps"* on Facebook, where she participated by *"sharing, commenting, and liking"* content on the groups. These groups, she said, had helped her get access to *"new job opportunities and new ideas"*. Another SHG member also shared her engagement with several online groups that made *"communication easier with friends and neighbours when there are social events, [religious gatherings], and happenings."* Consistent with SHG members' frequent mention of how digital technology had enhanced their spiritual life, especially through accessing spiritual songs and contents online, one participant said, *"there's a spiritual group created where we do spiritual things and share spiritual contents."*

Gorzo members were part of diverse online communities that played multiple roles in their lives. Some groups like "Mekelle Sisterhood" offered information about job and educational opportunities exclusively for women. It is also used to *"advertise our work and get to know new people, while having fun along the way"*, as explained by one of the Gorzo members, a model and a freelance social media manager. Similarly, another member spoke about a group called "Scholarship Term" where the group members shared several scholarship opportunities. She added: *"There's also a group called 'Graphic Design Points', which provides information about graphic design, including what it is, why it's important, and what kind of work you can do in this field. It's been quite educational."*

Another interesting social group from Mekelle was "Menderat Mekelle". Menderat, meaning neighbourhoods or villages in the Tigrigna language, is a group that exchanges need-based information about different neighbourhoods around Mekelle, as one participant described: *"If someone goes missing, their photo might be posted in the group. Since the group includes people from various neighbourhoods, it becomes easier to track down the missing person."*

Some members said that they were part of school groups where they shared school-related information such as course materials, announcements, and education-specific opportunities: *"Our classmates' group, we use it to share PDFs, course outlines, modules, class schedules, [and information on] campus events, debates or competitions... I am not such an active participant in sharing ideas, but I utilise information from there."*

Gorzo's online group also played a significant role in not only advancing the goals of the collective – i.e. advocating and fighting for gender equality in Tigray – but also disseminating important information and opportunities that facilitated the capacity development of its members. Digital literacy training was repeatedly mentioned, advertised through their channels, and delivered by third-party partners. One participant recalls: *"A training organised by CAMMCOM and Meta, as well as one by FemPeace on digital safety and security... The trainings focused on securing your online accounts, how to protect yourself from people who may try to attack you online, and how to use digital platforms safely."* In some cases, training also took place in a different country, but the recruitment and planning still happened online as explained by one of the Gorzo leadership: *"Another training was hosted by Digital Works Society on the same topics, focusing on digital safety, privacy, and security. This session took place in Uganda, and two members of Gorzo were able to participate."* In

addition to such training with partners, Gorzo also used these online platforms to exchange experiences and facilitate workshops such as *"how to search for scholarships, how to prepare a CV and cover letter, how to find funded scholarships – generally, how to prepare for scholarship applications."*

Other activities facilitated through these online groups included mentorship and networking opportunities: *"We often gain valuable life experiences; experienced people come and advise us, sharing their experiences, which makes us stronger"*. Such insights, coming from university students and young professionals, showed how invaluable these online networks could be in connecting them to people who could positively guide them through their personal and professional goals.

In some cases, the groups provided a sense of purpose and belonging to its members. *"Just seeing the group name reminds me of what I need to do,"* said one member, who was also a group admin, emphasising how the existence of the group and her responsibilities gave her a sense of focus.

As can be inferred from the online community engagement of both collectives, such groups served multi-layered purposes for their members. Catering to a range of needs, including practical, professional, advocacy, social, and spiritual, online communities could extend the functionality of digital tools far beyond their individual use. Such diverse and active engagement could, as exemplified by Gorzo members, maximise positive outcomes and compound the benefits of digital technology by building wider networks in addition to personal and professional development opportunities. On the other hand, limited availability and access to such diverse groups limited the level of positive outcomes.

7.3.3. Purposes of digital technology use

Across both Hawassa and Mekelle, the mobile phone was the most widely owned and frequently used digital device. Laptops and desktop computers were also used, particularly for tasks related to academic work, storing large files, and professional activities. However, the use of devices beyond mobile phones was more common among the youth collective in Mekelle than among the SHG collectives in Hawassa.

Communication was the primary use of mobile phones among all collectives, with apps like WhatsApp and Telegram being popular for staying in touch with family, friends, and fellow collective members. One member of Gorzo explained: *"Usually in order to connect with people, I use WhatsApp and Telegram. In Gorzo women's collective, we share information using WhatsApp, and I use Telegram to share information with my classmates."* Similarly, most SHG members mentioned their use of Telegram to communicate with their customers.

Mobile banking services were another everyday use of digital technologies, especially SHG members. The easy access to mobile banking, as well as the rapid growth of mobile money and banking services, made doing business more convenient for women in micro-businesses. Most of the members associated this with convenience, timesaving, and supporting overall business operations. *"It made transactions easier. For example, to avoid waiting in line [at the bank],"* one participant said. Another said that being able to track any financial activities through text messages easily had made managing finances easier.

Gorzo members more frequently highlight the **use of digital platforms for advocacy and collective organising**. They use platforms like TikTok and Facebook to engage in activism and advocacy, particularly around gender-based violence. These tools were also essential for internal coordination, with WhatsApp groups and e-mails being used to organise meetings, mobilise members, and plan collective action. One

member from Gorzo shared the following: *"For example, the members of the Gorzo women's collective, half of them are in Mekelle and half of them are in Addis Ababa. To meet and discuss things, they should come together, which is not possible at this time, but instead, we are using a WhatsApp group."*

This difference was tied not only to the nature of the members' professional roles and the purpose of their respective collectives, but also to the generational and educational gap, where the younger generation was more likely to explore a variety of digital technologies and possess the literacy level to support that. In contrast, older women, particularly in the SHG collectives, had more limited digital literacy and lower income levels, which restricted their ability to explore and adopt newer technologies.

7.4. Socio-demographic factors

Literacy levels had a strong correlation with how collective members navigated their devices and applications. This was evident in the educational difference between SHG and Gorzo members, where the respective groups exhibited different levels of sophistication in their everyday usage. For Gorzo members, who were predominantly university degree holders and students, their everyday usage included a range of advanced applications such as text and image editing applications, coding platforms, and access to online courses or school materials – skills that both supported and are reinforced by their education. On the other hand, while SHG members reported how their professional and personal lives had been transformed by digital technologies – such as being able to access their customers easily, promote their products and services on social media platforms, and maintain social ties – their usage tended to remain within functions that do not require rigorous tech skills. In some cases, members shared their reliance on their children or more tech-savvy individuals for assistance. While literacy was not the only factor shaping these patterns, it influenced members' confidence and capacity to explore and utilise a wider range of digital tools – both to build on their existing skills and learn new ones.

Income level and overall economic status were factors that had a high influence on adoption and the frequency of use of digital tools. Beyond individual income, the overall economic capacity of families, particularly among the younger generation, was a significant factor. This correlation was more visible among Gorzo members who grew up in households with access to technologies such as smartphones and the internet, which, combined with other factors, enabled early exposure and quicker adoption that reinforced their long-term digital skills and opportunities. Moreover, their better economic footing along with their educational level allowed them to own and operate multiple gadgets such as phones, tablets, and computers, which they seamlessly navigated for different purposes and to maximise positive outcomes. In contrast, most SHG members only owned phones, limiting the number of activities they could perform. They could not afford to buy other devices due to their income levels and other priorities that they allocate their incomes to. Nonetheless, despite Gorzo members being better resourced, many still noted that the high cost of advanced devices limited further upgrades that they said were important for their livelihoods. This revealed the multi-layered impact of economic status on different levels of digital engagement.

Occupation type also had a strong correlation with how certain tools were adopted and utilised. While the occupation type itself was correlated with educational level (i.e. some occupations might require more technologically demanding skills, which in turn required a certain level of formal literacy), the type of jobs the

collective members were engaged in influenced not only their usage but also outcomes. Most of the Gorzo members' occupations (e.g. digital marketing, coding, etc.) required them to have dynamic technological skills that were transferable to other everyday use, leading to an ongoing feedback loop, which further expanded their skills, networks, and opportunities. On the other hand, most SHG members' occupations were not contingent on their technological skills, which meant, compounded by other factors, they were not necessarily required to adopt them. This led to more static and localised outcomes that did not necessarily help the growth of their skills and opportunities. However, in some cases, we saw how personal interest in adopting technologies could reshape existing routines and ways of doing things and contribute to positive outcomes. This was true for some SHG members who, for instance, could reduce the time spent on commuting or increase their customer base by promoting their goods online, which improved their livelihoods. Nonetheless, the influence of occupation type was evident in how it shaped not only the initial adoption of technology but also the trajectory of its use – either reinforcing growth through continuous skills expansion, as with Gorzo, or limiting it to context-specific gains that improved livelihoods but did not substantially transform digital capacity, as is the case with SHG members.

In addition to occupation type, the **proactiveness of a collective** also shaped the outcomes and experiences of digital engagement. For the Gorzo collective, its very purpose and composition – coupled with a mission to empower its members technologically – played a crucial role in enhancing both the personal and professional lives of its members. In contrast, the SHG members did not prioritise technological advancement, and members' digital engagement was driven largely by personal interest or individual professional goals, such as selling their items online. As a result, there was minimal community-level engagement around technology within the SHG collectives. This shows that while belonging to a collective can potentially lead to better exposure and opportunities, this only happens when technological growth is embedded in the collective's mission and activities.

Age or generational gaps also had a strong correlation with the level of technological adoption and outcomes. This was particularly related to technological exposure, where the younger members of the collectives, particularly Gorzo members, had the advantage of being born and raised into an already technologically and infrastructurally advanced environment compared to older members – especially most SHG members, who had adopted modern devices and tools late. Such longer exposure to technology increased the speed at which members were able to catch up with the latest tools and applications once they acquired their gadgets.

Taken together, these factors – literacy level, economic status, occupation type, and generational exposure – while influencing digital technology usage independently, often intersected to shape the overall experience and outcomes of the women. This aligns with previous studies that showed that the mere availability of technologies and infrastructures does not guarantee optimal outcomes; rather, these outcomes are mediated by social, economic, and personal circumstances such as those described above. These are not the only factors at play, but they were the most evident in shaping the digital lives of the women collectives in this study.

7.5. Lived outcomes of digital technology usage

7.5.1. Positive outcomes

Participants highlighted a range of positive outcomes from digital technology use, spanning communication, economic opportunity, learning, and advocacy.

Enhanced communication and connectiveness through platforms such as Facebook and WhatsApp were seen as the top positive outcomes of digital technology use. Participants frequently mentioned how staying in touch with family and friends had been made easy through these platforms. For Gorzo, who had collective members living outside Mekelle, these platforms had made communication and coordination easier. Similarly, for SHG members, easy communication with customers and the ability to promote their goods using online platforms were noted as transformative. When asked if digital technology had transformed her personal life, one SHG member from Hawassa noted: *"Yes. It helped me manage my life, spiritual life, and social life well"* (referring to the online religious communities she was a part of).

“...digital technology is essential for connecting with clients. Even for work related to GORZO, I use digital tools. Most of my freelance clients are from abroad, especially for branding, logo and design work. I find these opportunities through digital platforms, and without them, it wouldn't be possible. I use tools like Adobe, Photoshop, Premiere, Canva, and recently Figma for graphic design and editing. The income I get using them is good.”

A 26 years old participant from Gorzo Collective shares her experience of using internet and digital technology to earn income

Using social media for inspiration and business support was a common theme, particularly among SHG members. They often used social media platforms to follow and learn from other businesswomen, drawing ideas and motivation from their experiences. In addition, digital financial applications were central to their daily activities, helping manage transactions and support their work as women in micro-businesses.

Improved efficiency and convenience in managing time and money were frequently mentioned positive outcome. For instance, participants mentioned the convenience of receiving orders and payments online and having them delivered. This was particularly useful for SHG members involved in microbusinesses, where they mentioned the ease of promoting goods, communicating, and transacting with clients using the internet and apps. One FGD discussant from the SHG shared the following: *"After starting to use digital technology, my customers can view the clothing they want online in a Telegram group without coming personally and order what they want, which makes the process easier... and I can have the money transferred to me digitally through mobile banking easily."*

Increased access to information and learning opportunities through the internet, where students, particularly Gorzo members, could explore educational materials that matched their learning styles, as well as opportunities for scholarships, were also noted. As one 23-year-old participant from Gorzo shared: *"I got a scholarship opportunity to learn for six months, and this is because of using [the internet], and this is one positive outcome for me."*

Raising awareness and advocacy was also noted, particularly by Gorzo members, as a key outcome. This was especially true for the role social media and the internet played as the main medium for campaigning and

advocacy work. One of the Gorzo members who was in charge of most online communication work described the role of social media in supporting the collective's goals: *"Social media is the primary platform we use for our advocacy work... As an organisation, our main goal is to create a society that upholds gender equality. We focus on advocacy, empowerment, capacity building... it plays a key role in our advocacy efforts."*

Online micro-entrepreneurship was another prominent positive impact, especially among SHG members in Hawassa. Several participants shared how they used social media to showcase their products, making it easier for customers to place orders and make payments via mobile banking or mobile money. One of the collective members from Hawassa said how her clothing business sales and service had improved because of her access to technology: *"I put pictures of the clothes online on a Telegram group for customers to see. If a customer likes and orders a cloth, they transfer the money to me through mobile banking, and I will have it delivered to them."* For Gorzo members, micro-entrepreneurship was mostly a side gig and seasonal rather than their full-time job. One participant mentioned earning up to ETB 20 000 (USD 144) per month by selling clothes online, which she ordered from the international retailer Shien.

Gorzo members highlighted online gig work as one of the benefits of digital technology. Some participants were engaged in various digital platforms to earn part or all of their income. Participants shared various ways they earned income online, ranging from remotely working for different companies to creating seasonal jobs for themselves and content creation. One participant, for example, shared how she sourced different assignments online from documentation jobs to subtitle translations that helped her earn most of her income. However, she noted that the income was not always consistent, and the amount varied from month to month: *"[For the documentation job] I earned ETB 300 000 (USD 2 100) for the whole project... and [for the translation work] I was paid ETB 15 000 (USD108)...on average, I'd say I earn around ETB 10 000 (USD 72). It can be much higher at times, but I also have periods where it's much less."*

The positive outcomes highlighted by the two collectives from the respective cities showed stark differences rooted in digital literacy levels, technological adoption, income levels, and a generational gap that afforded more cultural capital necessary for advanced navigation of digital tools. While collective members from Hawassa came from lower education levels and relied on a single source of income, members from Mekelle had advanced education, where income earned online was often complementary to other stable sources of income. As a result, how they invested the money they earned online was different based on their everyday responsibilities. For collective members from Hawassa, it was often spent on family and children, while for Gorzo members, it was often exclusively invested in their personal and professional development, which further enhanced their engagement with digital technologies. Moreover, in some cases, the supplementary income some Gorzo members earned exceeded Ethiopia's average monthly income of USD 51 (ILO, 2024), further highlighting how the digital divide can deepen existing economic disparity.

7.5.2. Facilitators of positive outcomes

Access to affordable digital devices was recognised as a foundational factor in positive outcomes. Although the cost of relatively better and advanced devices remained a barrier, the ability to access basic smartphones within participants' income ranges was noted. A Gorzo member said: *"While computers can be expensive and sometimes difficult to access, mobile phones are more affordable and readily available."*

Access to internet connectivity was one of the repeatedly emphasised facilitators of positive outcomes. This included access to mobile phones, mobile data, and Wi-Fi.

Existing digital literacy and skills were noted by most participants, as prior knowledge of how to navigate digital devices and a general curiosity to explore more contributed to consistent engagement with technology and openness to new developments. When asked about factors that made the use of digital technologies easy during a focus group discussion one participant from Gorzo said: *"Having access to a mobile phone, Wi-Fi, and the knowledge of how to use digital technology has been incredibly helpful for me. It has opened up so many opportunities and made it easier to stay informed and connected."* Interestingly, for most Gorzo members, as reflected both during the interviews and focus group discussions, existing knowledge and early exposure to digital technology stood out as major facilitators to positive outcomes.

Personal motivation and interest were also cited as crucial factors driving positive outcomes. Participants described their eagerness to learn new things, stay informed, and the desire to empower themselves as key contributors to their positive experiences. An SHG member shared the following in an interview: *"I was sad that I did not use digital technology while everyone was having one. That motivated me personally."* Another young Gorzo member added, *"...it helps me see what others are doing and also gives me a sense of what's possible if I take certain actions."*

Training and support organised within the collective has also been instrumental, particularly among Gorzo members. During the focus group discussion with Gorzo members, one participant shared that training was sometimes provided on how to effectively use social media platforms, which they found highly beneficial. The role the collective played in knowledge transfer and peer support from more advanced members was seen as a key factor – not only for carrying out the collective's work but also for establishing personal networks and helping individuals navigate online spaces more safely and effectively.

Supportive networks and communities, both in the participants' personal and professional lives as well as within the collective, were also repeatedly mentioned as key facilitators for positive outcomes and for overcoming challenges. This included receiving financial support from family members to cover device and data costs, neighbours providing access to Wi-Fi, children helping their parents with limited literacy, and more experienced colleagues assisting those with less technological exposure and skill. Women with children tended to rely on them when they needed to navigate their phones. One member of an SHG with three children shared how her daughter taught her how to use most of the technical tools: *"She shows me what to do when I need something and I ask her when something is not clear for me."*

7.5.3. Barriers to positive outcomes

Participants identified key barriers to digital engagement, including financial limitations, weak infrastructure, and gaps in digital literacy and formal support.

Financial constraints was one of the main barriers that was frequently mentioned. Despite the availability of a range of devices and internet packages, participants still noted this as a barrier. This was mainly because most participants were forced to stick to lower-quality devices – for instance, those with low storage capacity – and relied on only one type of device, often a mobile phone, even though they wished to have access to additional tools such as laptops and tablets.

As a Gorzo member noted: *"The devices are really expensive and not affordable. For example, the phone I have isn't the one I wanted, but I had to settle for it because I couldn't afford the one I need. My laptop also doesn't have the speed I need for my work... The prices are just unreasonable."* Moreover, while Ethiopia is known for having the cheapest data and Wi-Fi costs, these were still considered high based on the incomes of most participants. This was raised as a major barrier to spending more time on the internet and accessing resources they needed for everyday life, entertainment, work, and self-growth. Participants also pointed out how the rising level of inflation had made digital access more unaffordable due to price increases from telecom providers, including Ethio-Telecom, over the past year.

Lack of adequate infrastructure and connectivity was another major barrier cited by participants. Despite the continued expansion of network and coverage, several participants still reported challenges in accessing a stable network – even in urban areas – and noted that the issue was worse in remote areas. Moreover, frequent power outages were also noted as a persistent barrier to making full use of the potential benefits of digital technology.

Digital literacy and skills gaps were also among the key barriers raised. Participants, especially the SHG members, noted how they had never received formal support or training to improve their digital literacy skills. As a result, many relied on informal peer and family support, who themselves learned through trial and error or from others with slightly more experience. The focus group discussion with SHG members underscored this issue, stating how a lack of proper knowledge and space to explore and learn about digital devices was a major barrier to possible positive outcomes.

7.5.4. Negative outcomes and contributors

Participants outlined several negative outcomes of digital technology use, ranging from online scams and time loss to emotional harm and exposure to inappropriate or harmful content.

Vulnerability to online scams and hacking was one negative outcome that participants mentioned, especially members of the SHG. Risks of being hacked, including e-mail and social media accounts, and ransom demands, were noted as real concerns. One participant from Hawassa shared the following: *"I had received scam calls claiming that I won a prize...But I knew of these types of calls before, so I responded accordingly, and it was over."* On the other hand, a 25-year-old member from Gorzo shared a rather elaborate experience where her e-mail was hacked, which then led to the hacking of multiple accounts:

At one point, my e-mail accounts were hacked. The first one was compromised, and through that they accessed my second e-mail account. From there, they went on to hack my social media accounts, including Instagram. They demanded ransom, telling me that I had to pay to get my account back. I refused to pay, telling them they could keep it if they wanted. However, with the support of others, I was able to recover my accounts. Thankfully, there wasn't much personal information on those accounts, so it didn't affect me as much, but these targeted attacks are still very damaging. They take a toll on your mental health, time, and energy.

Poor time management and distraction were also among the frequently mentioned negative outcomes. This referred especially to the addictive nature of mobile phones and social media platforms that could easily consume and waste the participants' time. One focus group participant from Gorzo shared how she struggled

with excessive use of social media: *"It's frustrating because social media becomes so addictive. Sometimes, even in class, when the teacher isn't looking, I find myself using my phone in the middle of the lesson."*

Exposure to inappropriate content was another negative outcome mentioned, especially as a concern for younger children. A 23-year-old member from Gorzo shared how she had unlimited access to the internet from a young age, which exposed her to content she was not supposed to see as a child. *"If you remember when ISIS was slaughtering Ethiopians, I saw also that video,"* she said about the very graphic murder of Ethiopian migrants by the Islamic State of Iraq and Syria (ISIS) in 2015. Participants further felt that some content was often more harmful for women and girls than boys and men. A Gorzo member explained: *"For us as women... You might see people who are confident, and whose faces are visible, while they are joking about the rape of girls, which upsets you even more. You feel pain as a female, even if you haven't experienced it personally. Relatively, you feel it more than boys do."*

The **psychological and emotional toll**, especially associated with negative content and comments, was also raised as negative outcome of using digital technology. This often followed exposure to videos of violence, negative criticism, and insults. One collective member from Hawassa shared how people criticised women more than men for using their phones during meetings. She shared how being distracted is considered a woman's problem, who often receive negative comments in this regard: *"They say being a woman is nothing but being easily distracted and useless. This is not a pleasant thing to hear and could affect some of us psychologically."*

Excess exposure to violent and distressing content online had led some participants to feel frustrated, and in some cases, provoked a sense of hopelessness. One participant from Mekelle described her overconsumption of gruesome content online, giving the example of a massacre in Myanmar: *"I was becoming hopeless, and I hate[d] the condition of the world."* She also added how her family eventually took her phone away, and her father helped her recover from that feeling of hopelessness about the world by reminding her of positive things. These gendered criticisms and overexposure to negative content in general tended to lead participants to a constant sense of fear, hopelessness, and self-consciousness that hindered their full potential to utilise platforms, resources, and networks.

7.5.5. Gendered outcomes and barriers

Participants reflected on gendered barriers to digital engagement, including online harassment, social expectations, and the time constraints tied to unpaid care work.

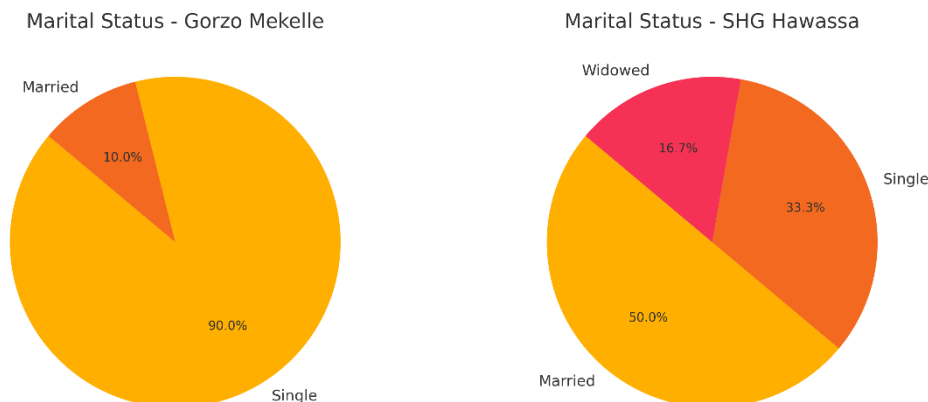
Online harassment and bullying were noted by participants, especially by members of Gorzo. This was more pronounced for them, as much of their collective work involved an online presence – not only as a group but also at an individual level. Participants described the pushback they faced in the form of harassment and bullying for their advocacy work on women's rights and the vulnerability that comes with maintaining a public presence online. During the in-depth interviews, one participant from Gorzo shared how identifying as a feminist in public and doing advocacy work subjected her to public scrutiny: *"Even though the work we're doing is beneficial to the community, being a feminist in this country is often misunderstood and distorted. This makes many things more challenging...People expect all the solutions from you, and if there are any attacks,*

you're the one who gets mentioned and insulted...On digital platforms, the insults linger forever... Every time something happens, you get attacked."

Societal and cultural expectations were also mentioned as a barrier to digital technology use by several participants. This was often tied to gender stereotypes that discouraged women from using technology, claiming it would have a negative impact, such as causing distraction. Some Gorzo members in particular noted how older people sometimes questioned women's frequent internet use, and how others in the community perceived women with dynamic tech engagement as less feminine, and attention-seeking.

Time constraints and balancing responsibilities were also raised, especially in light of women's unpaid care work and household responsibilities, which took up much of their time. This was more pronounced for married women with children, who often bore greater household and social responsibility, leaving them with too little time to engage with or explore digital tools.

Figure 11: Marital status



One focus group participant from Gorzo noted this, saying: *"Men tend to use digital technology more. Women, especially once they're married, use less, as they have more responsibilities at home like taking care of children."*

Similarly, a collective member from Hawassa said, *"I have to prioritise my responsibilities as a mother; therefore, I can't spend much of my time on my phone."*

7.5.6. Challenges of women collectives in conflict contexts

The increased cost of technological devices has been exacerbated by the conflict, with already high prices subsequently inflated by resource limitations and availability. Although Gorzo members did not explicitly link the unaffordability of devices and inflation to the conflict, teachers from Mekelle indicated otherwise.

Infrastructural issues were also mentioned as a challenge following the conflict. The destruction of facilities and network infrastructure added to existing challenges like power outages and poor connectivity, especially in remote areas. One participant shared how, during the blockade, she had to search for places with generators to charge her devices. She added that there was a time she was able to access a building with solar power: *"[S]o even if there's no electricity, the solar power [kept] things running. I also [made] sure always to have my power bank with me and [kept] my devices fully charged. That way, if my phone [ran] out of battery, I [could] recharge it using my laptop."*

Lack of timely access to information was also reported as a significant consequence, leading to lost educational and employment opportunities. In connection with this, participants shared how the disconnection from the internet and overall connectivity left them feeling “*left behind*” – particularly as global digital developments like AI and other tools advanced. At the same time, they were unable to keep up. One participant shared her experience: *"[A] significant challenge I've faced was during the period of siege and blockage...During that time, we were completely disconnected from the rest of the world. It was during this period that technologies like ChatGPT and AI were emerging, and even after that, it took me a long time to catch up and familiarize myself with AI. I felt like I was falling behind."* A 25-year-old university student seeking a job in e-commerce also shared how the conflict left a huge information vacuum that made it difficult for her to navigate the job market. She said: *"We, the people of Tigray, have been living under siege due to the recent conflict, and this has resulted in a severe lack of access to information. This lack of information makes it incredibly difficult to find suitable employment."*

7.5.7. Conclusion

Digital technology was a powerful enabler for women’s collectives in Mekelle and Hawassa. However, its impact came as much from the women’s ingenuity and mutual support as from the tools themselves. Across differences in age and education, a common thread emerged: given basic mobile access and an encouraging community, women would leverage technology to expand communication, economic participation, and advocacy. Younger activists in Mekelle dived into a wide range of apps and social media to amplify their voices, while older entrepreneurs in Hawassa stuck to practical uses like messaging and mobile banking to support their micro-businesses. Despite differing tech savviness, both groups showed that when women have access and encouragement, they seized every opportunity to strengthen social bonds and livelihoods online.

Digital engagement had made communication easier and opened new economic opportunities, while also amplifying the women’s collective voice. Members used mobile apps to stay in touch with family and fellow members, keeping the group close-knit even when apart. Many had moved business tasks online – showcasing products on social media and completing sales via mobile money – which saved time and expanded their reach beyond their neighbourhood. Some also used the internet to learn new skills or look for jobs, broadening their horizons. Just as importantly, digital platforms had given the collectives a louder voice and a broader peer network. In Mekelle, campaigns against gender-based violence gained momentum on Facebook and TikTok, rallying support beyond their usual circles and carving out a public space for women’s rights. In Hawassa, SHG members found inspiration and advice through social media connections with other businesswomen, exchanging ideas and encouragement. These examples all pointed to the same outcome: even modest use of technology was directly enriching women’s lives and empowering them to engage more boldly in their communities.

Structural barriers still limited the full potential of these digital gains. Economic constraints were a persistent challenge: many women could not afford high-quality devices or stable internet access, so they relied on a single basic smartphone and rationed their internet use. Even as network coverage expanded, the cost of connectivity made online access a luxury for some – they often postponed non-essential internet use until they could pay for the next recharge. Unreliable network signal and frequent power outages compounded the problem, regularly interrupting online activities in both cities. In Mekelle, the recent conflict further damaged

networks and caused prolonged internet blackouts, leaving members cut off from the digital world for months. Such barriers of cost and connectivity imposed a hard ceiling on what women could do online. No matter how motivated they were, inconsistent access meant their use of technology often stayed limited to essential, low-bandwidth tasks, stifling more creative or ambitious applications.

Social and cultural norms further restricted how women engaged with technology. In conservative circles, a woman who was “too active” online risked gossip and disapproval, as though she were neglecting her family or overstepping her role. This pressure led many to self-censor and stick to socially approved uses of the internet to avoid conflict. Moreover, women who did speak out – like the Mekelle activists – often faced online harassment, which could quickly silence even the boldest voices. Moreover, the heavy domestic workload on women, especially married women, left them little time or energy to explore new digital tools. After fulfilling work and family duties, few had time to tinker with apps – a stark contrast to most men. In the end, many women were forced to limit their internet use to “safe” tasks like family communication or business transactions that wouldn’t invite criticism.

Despite these challenges, the women of Mekelle and Hawassa displayed remarkable resilience and creativity in navigating the digital space on their terms. These users refused to be passive; when obstacles arose, they found workarounds. For example, they borrowed phones or shared data when needed or went online during off-peak hours to cope with limited connectivity. Importantly, they had learned to protect themselves as well – adjusting privacy settings, sticking to trusted circles, and blocking harassers or scam attempts. This was particularly true for members of the Gorzo collective, who had greater access to such training and skills-sharing opportunities through their work as well as greater exposure afforded by their educational background. Through such strategies, they avoided many online harms. These women actively managed their digital lives rather than being overwhelmed by technology’s downsides. In contrast, digital technology capacity building in Hawassa occurred more at the individual level, with peer or family support, without being backed by institutional or collective support.

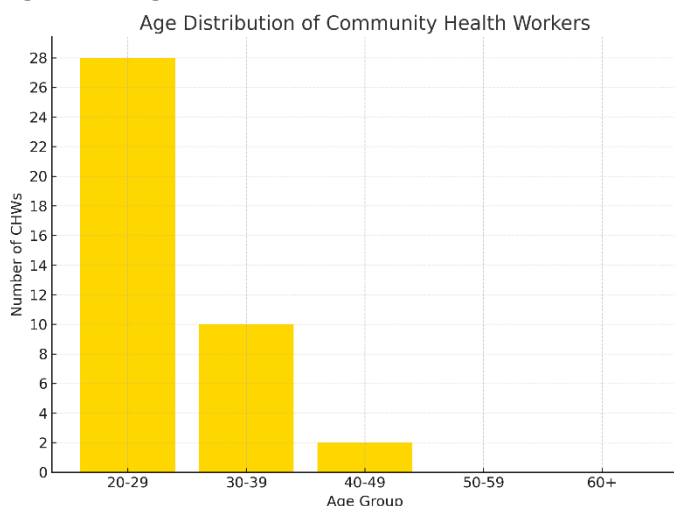
Ultimately, the experiences of these collectives showed that closing the digital gender gap requires more than handing out smartphones or internet connections – it demands tackling the economic, infrastructural, and social barriers that hold women back. These women had already demonstrated the drive, solidarity, and ingenuity needed to harness digital tools for their advancement. With more affordable, reliable access and greater acceptance of women’s online presence, their gains could scale dramatically.

8. Community health workers

Hawassa and Semera

8.1. Community health workers' context and population profile

Figure 12: Age distribution of CHWs



The CHWs in this study, predominantly women in their mid-20s to mid-40s, served in government roles in Hawassa (a major southern urban centre) and Semera or Logiya (a smaller town in the Afar region). While marital status varied, many participants were married. Educational backgrounds differed notably: Hawassa CHWs often held higher qualifications (including bachelor's or master's degrees), while Semera participants were typically health extension workers with secondary or diploma-level training.

In total, 40 CHWs from Hawassa and the Semera/Logiya region participated in the in-depth interviews. The participants ranged in age from 21 to 42 years, with 57.5% between the ages of 25 and 29, 12.5% each in the 20–24, 30–34, and 35–39 age brackets, and 5% aged 40 or older. Nearly all participants (97.5%) were employed full-time, with only one respondent (2.5%) reporting part-time work. Government sector employment dominated the sample, accounting for 92.5% of responses, with 5% employed in the private sector and one entry (2.5%) not recorded. In terms of marital status, 55% were married, 42.5% single, and one participant (2.5%) was divorced. Educational attainment varied: 40% held diplomas or certificates (often from health extension worker training), another 40% had bachelor's degrees, 10% held master's degrees, and 5% had completed secondary school only; one participant (2.5%) gave an unspecified education history, and another did not respond. In terms of religion, the sample included 42.5% Muslims, 37.5% Protestants, and 17.5% Orthodox Christians, with one respondent's affiliation not recorded. Participants were evenly split between regions, with 50% from Hawassa and 47.5% from Semera/Logiya (one entry was missing). Half of the participants (50%) reported having no children, while the rest had between one and four children. The participants' work experience ranged from 0 to 17 years, with 27.5% having between 0 and 2 years of experience, 37.5% having 3 to 5 years, 22.5% having 6 to 10 years, and 12.5% having 11 to 17 years of experience.

All had some experience with mobile phones, but how they started using digital technology varied. Many received their first phones within the past decade, often through a spouse or parent. In Semera, financial and

cultural barriers delayed access for some, with a few women only recently acquiring smartphones. Internet use had grown gradually – Hawassa CHWs often began accessing the internet in the early 2010s, while Semera participants came online more recently and inconsistently. Connectivity remained a challenge, especially in Semera, where most rely on limited mobile data; in contrast, many Hawassa participants had Wi-Fi at work or home.

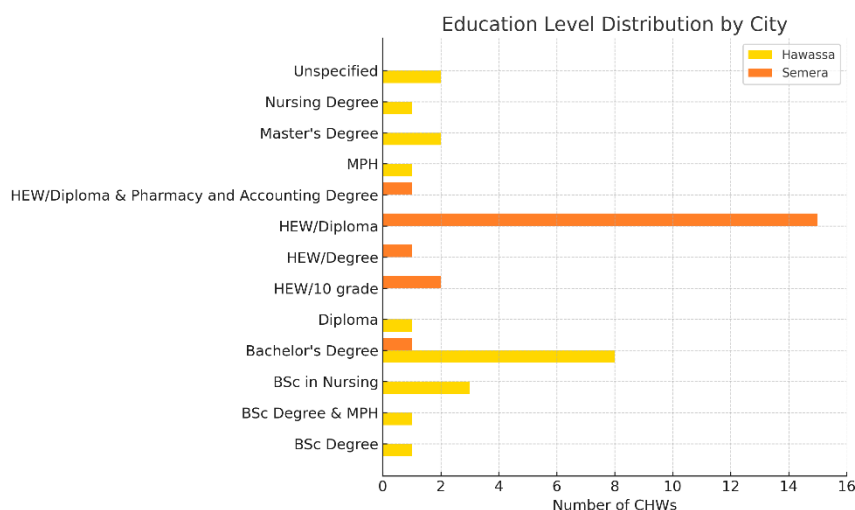
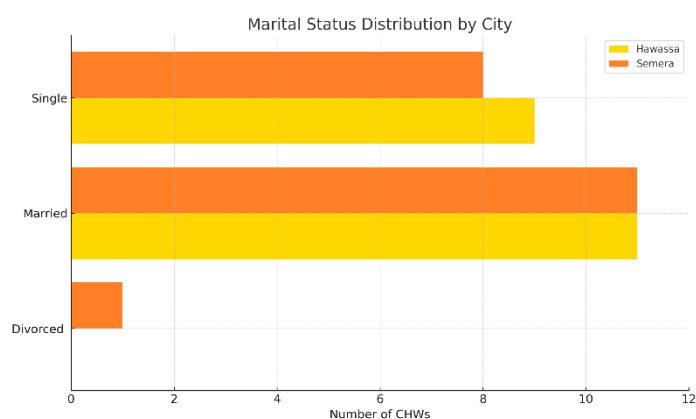


Figure 12: Education level distribution by city

Digital literacy developed informally. None of the CHWs had formal digital training, instead learning through self-teaching and peer or family support. This reliance on personal networks for building digital competency was common across both sites.

Figure 13: Marital status distribution by city



Overall, Hawassa CHWs tended to have more experience and better infrastructure, while Semera CHWs faced tighter constraints but were rapidly adapting. Focus groups reflected this divide: in Hawassa, CHWs spoke more confidently about tech use – including digital inclusion for people with disabilities – whereas Semera participants emphasised limited access and gendered restrictions. These contrasting contexts framed their digital journeys.

8.2. Digital journey of community health workers

8.2.1. First mobile phones: Timing and motivation

Most CHWs in both Hawassa and the Semera/Logiya region received their first mobile phones as teenagers or young adults. Many participants recalled getting a phone while in secondary school or upon entering higher

education. The primary motivation was often to stay in touch with family for safety and support, especially when living away from home for school or work. For example, one Hawassa respondent said: *“I was in 9th grade... and I wanted it to help me in my school... The one who bought it was my father because he was encouraging towards education.”* Parents frequently provided the first phone as a means *“to check on me”* during late study hours. Likewise, in Semera, a CHW recalled getting a basic phone in Grade 8 from her mother to stay connected: *“When I was [in] Grade 8... my mother [gave] me [a] small phone, not [a] smart phone”*. In both regions, maintaining family communication was a key driver. Some also noted additional personal motivations, such as using social media or accessing educational resources, once they had a phone.

8.2.2. Acquisition and learning to use the device

Because early devices were usually simple feature phones (not smartphones), most CHWs found them easy to operate with basic calling and texting. Almost all obtained their first phone through family support or personal savings. In Hawassa, it was common for parents or older siblings to purchase the phone. In a few cases, spouses played this role – one participant noted her husband bought her a phone when she was a student so they could stay in contact during his travels. Initial learning was informal: many taught themselves or received help from peers and relatives. One Hawassa participant explained that *“it was mostly dialling, so I had previous experience from my classmates’ phones, which made it easier for me”*. Others had family guidance; for instance, some were shown the basics by a tech-savvy parent or sibling. In the Semera/Logiya group, women sometimes relied on friends or extended family for support. One CHW from Semera shared that her aunt taught her how to use her first phone. Another described a largely self-directed learning process after her brother gifted her a phone, saying *“I practiced how to use [it]... from others’ [phones] so I use it by myself”*. Overall, formal training was unnecessary – basic phones required only simple skills that participants picked up through observation and practice.

8.2.3. Transition to smartphones and internet use

As mobile technology evolved, so did the participants’ devices. After a few years (often during college or early career), many upgraded from basic handsets to internet-capable smartphones. Some explicitly mentioned buying a new phone once they needed online access. A common pattern was a gap between first owning a phone and first using the internet when a smartphone was acquired. For example, a Hawassa CHW received her first phone in Grade 10 but *“connected to [the] internet five years after [her] first phone”* – essentially only after obtaining a smartphone.

Others – especially those whose first device was already a smartphone – went online immediately. *“I connected to the internet as soon as I got my first phone,”* said one respondent. Facebook was often the first internet application; several participants recalled using Facebook once they eventually got online. One participant from Hawassa even tied her first internet use to a major life event, noting that she first went online *“in the summer of 2016... I had just given birth.”* *“That’s also when I used Facebook for the first time,”* she said. These examples illustrated how the introduction of smartphones and mobile data opened new avenues for communication at pivotal moments in their lives.

Across both regions, the timeline to adopt smartphones and the internet was influenced by availability and personal circumstances. Hawassa CHWs – generally in an urban setting – often adopted smartphones slightly

earlier and more independently. In contrast, some Semera/Logiya CHWs obtained smartphones later or through spousal support (one Semera participant's first phone, for instance, was a "small Samsung smart phone" given by her husband about 12 years ago). By the time of the interviews, however, virtually all participants in both locations were using smartphones and had been online for several years.

8.2.4. Digital empowerment

At the time of the study, the CHWs' use of digital technology was far more advanced than the simple calling and texting of their first phones. Virtually everyone owned a smartphone, and many Hawassa respondents also used additional devices like laptops or desktop computers for work and personal tasks. The smartphone had become an essential tool not just for personal communication but also for professional duties. One participant explained that her Android phone was indispensable for her job: *"I use it for work and to connect on social media. My work needs me to stay connected, so I use it to get information."*

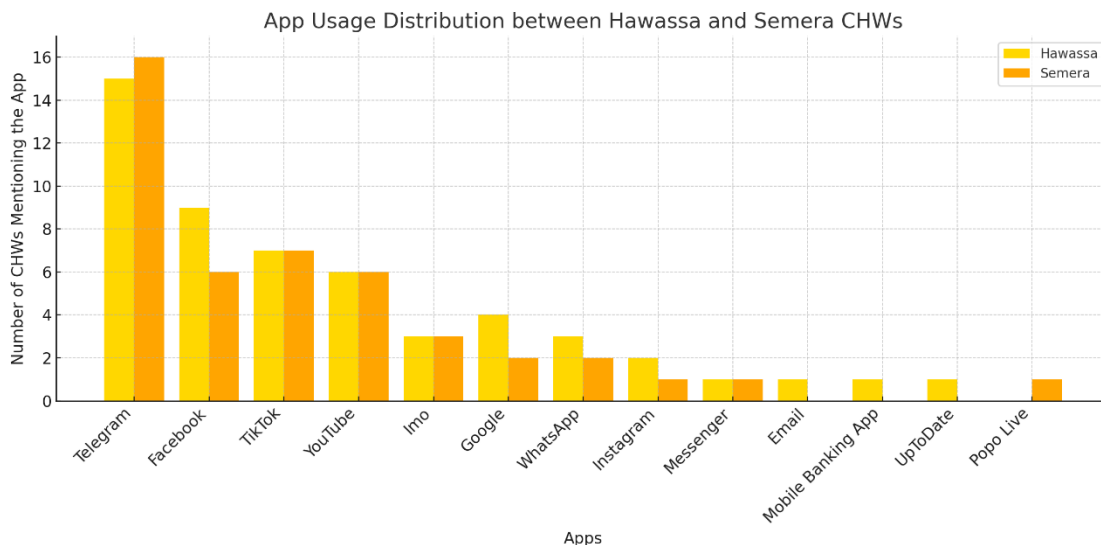
CHWs commonly used messaging apps and social media to communicate with both colleagues and family. As one Hawassa respondent noted, she used *"Telegram to chat with family and relatives"* and WhatsApp to keep in touch with relatives abroad. Several also mentioned using mobile banking services and other apps for information, reflecting a broadening of digital activities beyond socialising.

Smartphones had increasingly blurred the line between personal and professional life for these health workers. Some had even leveraged their devices for career development and entrepreneurship. For example, a nurse from Hawassa described that her current phone (an iPhone) supported side-business ventures in addition to her health work: *"My current phone is an iPhone. I use it for my online business in addition to my professional work."* This evolution demonstrated how, over time, CHWs moved from using phones purely for basic communication to integrating them into work routines and even income-generating activities.

In a few cases, regional and socio-cultural factors had introduced challenges or delays in this digital progression. One Semera participant's use of technology was temporarily limited by her family situation – she lost access to a smartphone for several months because *"my husband [did] not allow me to have [a] phone... he doesn't want to see me call my siblings who [are] abroad"*. She eventually persuaded him and was permitted to buy a new phone, illustrating how personal relationships can shape access to technology. Another Semera CHW experienced a setback after her husband's death, having to revert to a basic phone due to financial constraints (she no longer had a smartphone after her husband's loss and had to rely on a simple handset). Despite these individual hurdles, the general trend in both regions has been toward greater digital empowerment.

8.3. Everyday use and practices

Figure 14: App usage distribution, Hawassa and Semera



CHWs in both Hawassa and Semera had integrated smartphones into their daily routines for both **work** and **personal life**. However, the extent and diversity of use differed

due to infrastructure and exposure.

8.3.1. Frequently used applications

CHWs in both Hawassa and Semera/Logiya relied on a core set of mobile applications in their daily routines. Messaging and social media apps dominated their usage. Nearly every participant mentioned using Telegram daily – it was a ubiquitous communication tool, often employed for both work group chats and personal messaging. WhatsApp was also common, particularly for keeping in touch with family or making voice calls (e.g. contacting relatives abroad). Many CHWs engaged with Facebook as well, using it to read news or stay connected socially. TikTok emerged as a frequently mentioned app for entertainment during free time, and several mentioned YouTube for watching videos – often for educational content or religious inspiration.

In addition, some used Google as a search engine daily to quickly look up information related to work or personal interests. Individuals noted a few other apps: for instance, one participant used a mobile banking app for financial tasks, and another with a medical background mentioned an app for professional reference (“Medical UpToDate”) to support her work. In the Semera/Logiya region, Imo (a video-calling app) was often used to communicate with friends and family via video chat – a preference less noted in Hawassa. Overall, CHWs’ daily app usage centred on communication (Telegram, WhatsApp, Imo), social networking (Facebook, Messenger, Instagram), and content consumption (TikTok, YouTube), reflecting a blend of work and leisure needs.

8.3.2. Purposes of digital technology use

Phones were vital for CHWs, serving both professional and personal purposes. For work, they used digital tools to coordinate with colleagues, share information, and stay updated on medical knowledge. Apps like Telegram and social media enabled quick communication, while platforms like YouTube and Google supported continuous learning and healthcare updates. Personally, CHWs used their phones to stay connected with family, especially those abroad, and for recreation, watching videos or browsing social media.

Additionally, some young CHWs engaged in businesses or creative activities, leveraging digital platforms for extra income. In sum, phones were essential for communication, professional development, and leisure.

Work-related practices were among the common everyday uses, especially among CHWs in Hawassa, where they regularly used WhatsApp, Telegram, e-mail, and Google tools to coordinate tasks like immunisation schedules, health messaging, and reporting. These platforms enabled efficient **communication** with colleagues and supervisors and allowed instant access to health resources. As Zahra, a CHW from Semera, noted: *"Telegram helps to report our daily work for our boss to post what we have done at the community level"*. Hawa, another CHW from Semera, added: *"I use Telegram to post our works like pictures and videos, and we also sent our report to groups."* In contrast, CHWs in Semera relied more narrowly on Telegram and Imo, mainly for **reporting and updates from health bureaus**. Due to unreliable connectivity, they often submitted reports from *woreda* (district) offices or internet cafés and continued to rely on paper when networks failed.

Smartphones were described as tools that "make work easier," especially for documenting visits, sharing reports, and accessing reference materials. *"It is important for me, especially for my work, that after I have done my work, I can post it in a Telegram group, so it saves my time because I am not expected to go to the office to show my work to my boss,"* said Asiya, a health extension worker from Semera. Telegram was especially valued for its simplicity and low data usage. CHWs noted that digital tools complemented, rather than replaced, face-to-face work – phones were used during outreach to show videos or record attendance.

Creative outreach efforts were regularly for CHWs in Hawassa, such as broadcasting pre-recorded health messages or exploring platforms like TikTok to reach younger audiences. Such innovation was not observed in Semera, where efforts remained focused on essential communication amid resource constraints.

Personal and social uses outside work were also frequently reported. CHWs used digital tools to stay **connected with family**, especially across long distances. Video-calling apps like Imo were key in Semera, where migration is common. CHWs also used the internet for **self-learning** – seeking parenting tips, recipes, and household advice. Some, particularly in rural areas, described gaining access to new knowledge through tutorials and forums.

Entertainment was part of their daily digital life. Hawassa CHWs streamed music, videos, or religious content, often using Wi-Fi. As Tsion explained: *"Telegram to chat, YouTube to watch self-development and religious videos, Instagram to be up to date"*. In Semera, mobile-friendly apps like TikTok and Facebook offered accessible leisure options.

One participant reported **generating income** through Poppo Live, a streaming app with interactions that could be monetised. Though rare, such examples showed how even rural CHWs were exploring new opportunities. In Hawassa, CHWs had not yet ventured into ways to generate income online but expressed interest.

8.3.3. Daily time spent on devices

“

I mostly use Poppo Live...
I go live to earn more coin
to (later) change it to
(physical) money; Telegram
to send data and report; I
use TikTok and post photos
I really like photography so
I use all social media.

”

Rahwa, a community health worker from Semera, explains how she uses Poppo to experiment with income generation and uses other platforms to share photos across social media

Daily screen time varied widely among the participants, reflecting their differing lifestyles and levels of reliance on technology. A number of CHWs reported relatively moderate use, on the order of an hour or two per day. For example, several said they spend roughly *“one to two hours per day”* using the internet or their phone, often squeezed in during breaks or after work. Others estimated even less – one senior participant guessed only about 30–40 minutes daily on her phone because of her busy schedule. On the other hand, some participants – typically younger or those who had integrated phone use into side-work – indicated higher daily usage. It was not uncommon for these individuals to spend three to four hours a day on their devices. In one case, a respondent admitted to using her phone three to four hours every night for activities like making videos, taking orders, and communicating (essentially turning her phone into a tool for a part-time business). A few extreme cases were reported as well: one CHW estimated her screen time at *“eight to 10 hours per day”*, which is exceptionally high. Another from Semera noted she could be online up to nine to ten hours on some days when actively engaging in a live-streaming platform for income. These heavy users tended to be exceptions, however. It is important to note that some participants spent almost no time on apps or the internet – for instance, a couple of CHWs did not have a smartphone at the time of the study (due to affordability or other reasons) and thus only used their basic phone for calls. In general, though, most CHWs fell between these extremes, with a significant number saying they used their phones/internet on the order of one hour daily (or a bit more on free days). This suggested that while digital tools were present in their everyday life, many integrated them in a limited, purposeful way given their work and family responsibilities, with only a subset of individuals (often younger or single CHWs) engaging in prolonged daily usage.

8.4. Socio-demographic dimensions

The digital practices of CHWs in Hawassa and Semera/Logiya reflected significant variations shaped by geography, age, marital status, occupation, income, and literacy levels. These differences highlighted both structural barriers – such as access to resources – and personal factors that influenced how CHWs engaged with technology in their daily lives.

Location played a central role in shaping digital habits. CHWs in Hawassa, benefiting from urban infrastructure, had better access to Wi-Fi both at home and work, which influenced their device choices and usage patterns. Many Hawassa-based CHWs preferred using Wi-Fi for data-intensive activities such as streaming videos or downloading files, while mobile data served as a backup. The availability of Wi-Fi enabled a more diversified and stable digital experience, often alongside the use of computers for professional tasks like accessing health databases or watching educational videos. In contrast, CHWs in Semera/Logiya, due to limited access to reliable internet and high mobile data costs, primarily used smartphones with mobile data. The lack of Wi-Fi meant they relied on mobile data packages for daily connectivity, which restricted their use to more essential tasks, such as communication and basic information searches. Notably, CHWs in Semera often favoured Imo for video calls, a choice not as prevalent in Hawassa, where WhatsApp or Viber dominated. This geographic divide in internet infrastructure created stark contrasts in how digital tools were accessed and utilised across regions.

Age also influenced the way CHWs used digital tools. Younger CHWs (in their 20s) displayed more extensive and varied usage of smartphones and apps. Many of them were digital natives who were comfortable with multiple platforms, including social media apps like TikTok, Facebook, and Instagram for both socialising and

side-business activities. These younger workers often reported higher screen time, reflecting their more integrated use of technology for both work and personal activities. Conversely, older CHWs (in their late 30s and 40s) tended to use technology in a more purposeful, work-focused manner. They typically limited their device use to professional communication (via apps like Telegram or WhatsApp) and information consumption (e.g. health-related updates). The lack of time for leisure apps, due to work and family obligations, resulted in lower screen time among older participants. The shift in tech engagement with age highlighted how younger CHWs were more inclined to embrace the full spectrum of apps and digital tools, while older workers focused on specific, job-related uses.

Marital status had a direct impact on how CHWs allocated their time and energy for using digital tools. Married CHWs, particularly those with children, tended to use their phones more for practical tasks (e.g. staying in touch with family or managing household responsibilities) rather than for leisure. Their screen time was often limited to brief intervals, such as during breaks at work or after family duties have been attended to. This contrasted with single CHWs, who generally had more leisure time and reported longer digital engagement, including more frequent use of social media or apps for entertainment and side projects. Some married CHWs also noted that family dynamics (such as husband's control over devices) could limit their access to smartphones or restrict app usage, which further shaped their digital experience. On the other hand, single CHWs or those without children tended to have more autonomy over their digital habits, often spending more time on platforms like TikTok or using their phones for personal development activities like online learning or side businesses.

The nature of a CHW's **occupation significantly affected how they used digital tools**. CHWs in clinical settings (e.g. hospitals or health centres) often had access to advanced digital systems at work and may use desktops or specialised healthcare apps for tasks like patient record management or accessing medical guidelines. Their phones were typically secondary devices, used for communication and occasional research. On the other hand, community-based CHWs (such as health extension workers) were more reliant on their smartphones for work-related tasks. They used Telegram and Imo to report data, communicate with supervisors, and share updates from the field, effectively using their phones as mobile office tools. This dependency on smartphones reflected the nature of their work and the lack of other digital resources. Some CHWs also used digital tools to augment their income, using their phones for online marketing, content creation, or business activities, with younger CHWs being more likely to engage in such practices.

Income level was a major determinant of digital access and device quality. Many CHWs, particularly those in lower-income households, struggled to afford new smartphones or data packages. For instance, some participants reported spending up to ETB 800 per month on mobile data, a significant portion of their monthly income, which limited their ability to use digital tools as freely as they would have liked. In these cases, CHWs often prioritised Wi-Fi when available, as it provided more cost-effective access to the internet for data-heavy activities. CHWs from higher-income backgrounds or those with support from family were generally better equipped to afford high-end devices and stable internet connections. However, even within these groups, device affordability remained a concern. Some reported receiving devices as gifts from family members abroad, illustrating the economic disparities in access to digital tools. The economic divide played a crucial

role in shaping who could fully engage with the digital world and who remained limited by financial constraints.

Educational and digital literacy levels also shaped how CHWs used technology. Those with higher formal education (bachelor's or master's degrees) tended to be more confident in using complex digital tools for professional growth. They integrated technology deeply into their practice, using apps, research databases, and specialised medical tools to stay up to date on health trends and global best practices. In contrast, CHWs with lower levels of education or limited exposure to digital tools often engaged with technology in a more basic way. They typically used smartphones for communication and basic research and relied on familiar apps like Telegram for essential tasks. Some expressed challenges with more advanced digital skills, noting that they found it difficult to explore new tools without the proper training or access. Digital literacy was often self-taught, as many CHWs relied on friends or colleagues to help them navigate new apps or resolve technical issues. Lower literacy could create a digital divide where those without the skills or resources to fully explore technology may miss out on educational and professional opportunities. Nonetheless, even those with limited literacy recognised the importance of digital tools, especially in keeping up with medical advancements or staying connected with colleagues and family.

In summary, location, age, marital status, occupation, economic condition, and literacy levels all intersected to shape how CHWs used digital technologies. While digital tools were becoming essential in their professional and personal lives, these factors created significant variations in access and engagement. The increasing reliance on technology across different socio-demographic groups reflected a complex interplay of structural inequalities and individual choices.

8.5. Lived outcomes of digital technology usage

8.5.1. Positive outcomes

Digital technologies **improved educational outcomes**. They had significantly enhanced CHWs' access to information and learning opportunities. Many CHWs described how the internet enabled them to easily look up medical knowledge or best practices on their own, rather than relying solely on colleagues or manuals. This immediate access to health information helped them update their professional knowledge – Genet, a CHW from Hawassa, noted that digital tools made it “*really impactful*” to obtain new information or even revisit old course material when needed. Some had taken online training related to their field or used specialised apps (e.g. medical reference tools) to improve their skills.

Beyond formal learning, CHWs also used digital media to gain practical know-how for personal and community benefit. For example, they reported learning about childcare techniques, nutritious recipes, and home remedies for common ailments through online videos and forums. Such information was then passed on to others – several CHWs mentioned sharing health tips with community members or teaching their children using knowledge gained online. Overall, digital access had expanded CHWs' knowledge base, keeping them informed about health topics and even general world events, which in turn enhanced their effectiveness and confidence in their role.

Notably, CHWs in Hawassa often reported engaging in these educational opportunities more fully – some pursued online courses or used apps during their formal training. In Semera/Logiya, CHWs also valued the learning aspect of digital tools, frequently using phones to obtain health information to educate their communities. In some cases, limited language or connectivity meant they learned in more informal ways (like watching regional health videos) rather than structured online courses. Despite such challenges, across both regions, the net effect was growth in knowledge and skills due to digital technology.

Across the board, CHWs highlighted how digital tools **enriched their social connections and personal lives**. Messaging apps and social media had made it much easier to stay in touch with family and friends, especially those far away. For instance, a Hawassa CHW noted that having a smartphone allowed her to communicate effortlessly with family members who lived outside the city, even those abroad. Others echoed that platforms like Telegram, Facebook, and WhatsApp helped them maintain relationships and expand their social circles beyond their immediate community. Several CHWs mentioned that they could now reconnect with friends or relatives who had drifted apart, as the internet “makes connections easier” and bridges long distances. As Genet from Hawassa shared, *“I was able to keep in touch with family and friends.”* This sentiment was echoed by another CHW from Hawassa, Tsion, who noted that *“digital technologies made me closer with people who drifted apart from me.”*

Social media also enabled them to share ideas and interests with a wider network. For example, some enjoyed sharing religious content or parenting advice and engaging in online discussions with peers. This helped strengthen their sense of social support and belonging. In their personal lives, access to online content had been beneficial for self-improvement and well-being. CHWs described finding valuable information on topics like marriage, motherhood, and self-care through digital platforms, as well as learning from others’ experiences, and applying those lessons to their own lives. A few even credited the internet with broadening their perspectives and improving soft skills (such as communication), as they interacted with diverse people and content online.

Regional context shaped some of these social outcomes. In Hawassa, where connectivity and usage were relatively higher, CHWs often leveraged multiple apps to both socialise and collaborate professionally – for example, they might discuss work ideas with colleagues in a Telegram group and simultaneously keep up with old friends on Facebook. In Semera/Logiya, CHWs equally appreciated the communicative value of digital tools. However, many emphasised basic communication needs: using their phones to talk with friends and relatives or to get news updates from outside their isolated region. Notably, in the conflict-affected context of Semera/Logiya, a personal benefit was psychological relief – Rahel, a CHW from Logiya, shared that browsing online content or social media helped her “forget and relax” during periods of stress and uncertainty after local conflicts. Whether by maintaining family ties, enlarging their social network, or serving as a source of comfort, digital technologies had positively transformed CHWs’ social and personal lives in both regions.

Digital platforms had opened **new economic possibilities** for many CHWs, particularly in Hawassa, although some benefits were seen in Semera/Logiya too. Several CHWs had started small online businesses or side jobs enabled by social media and messaging apps. For example, several Hawassa-based CHWs supplemented their income by marketing goods online: Eyerusalem, a 42-year-old CHW from Hawassa, sold a traditional spicy paste via Telegram (with help from her children on TikTok) and earned around ETB 4 000–5 000 per month by

reaching customers beyond her local area. She was even able to send orders to Addis Ababa, demonstrating how digital tools removed geographic barriers for entrepreneurs. Haimanot, another CHW from Hawassa, used TikTok, Telegram, and Facebook to promote a small second-hand (*Bonda*) clothing business – she reported making between ETB 5 000 and 10 000 on average. She has expanded her enterprise by hiring helpers and involving her sister, effectively creating jobs for others in the process. Another participant, Betelhem from Hawassa, mentioned using a TikTok page to sell homemade fast food on the side, earning a modest extra income of a few hundred ETB and gaining support from her network, who shared her posts.

These examples illustrated how tech-savvy CHWs, especially in urban Hawassa, were leveraging digital platforms (like social media, online marketplaces, and even bank-sponsored e-commerce programmes) to generate additional earnings. They often advertised products or services online and took advantage of features like group chats or pages to reach more customers. Importantly, the financial benefits went hand-in-hand with increased economic empowerment – CHWs mentioned using their online income to cover household needs, contribute to savings groups (*equb*), and pursue personal goals. In Semera/Logiya, far fewer CHWs reported active online business ventures, reflecting both more limited digital engagement and local constraints. Many in Semera said they hadn't started any online income activity, often citing lack of time (due to workload and family duties) or lack of know-how and tools as reasons. Nonetheless, a few experimented with e-commerce on a smaller scale. For instance, Aminat, a CHW from Semera, used an online platform to show clothing to potential buyers (even if mostly family) and earned a small commission on any sales. Another tried generating income on a live-streaming platform, called Oppo Live, designed for online interaction and games.

Several **emerging outcomes** were observed. In addition to the clear educational, social, and economic improvements, CHWs experienced some less expected positive outcomes from using digital technology. One notable outcome was personal development and empowerment which happened in subtle ways. Several CHWs mentioned that being online helped them “*widen [their] perspectives*” and become more confident in communicating. Exposure to diverse ideas and communities via the internet had, in effect, broadened their worldview beyond what their local environment offered. As mentioned, some even noted improvements in soft skills – for example, one CHW felt that using social media had improved her conversation skills and ability to engage with others. Others found that digital platforms sparked new interests and hobbies. Aside from her work and business, Haimanot, a CHW from Hawassa, started creating and sharing videos of herself singing and cooking, and vlogging about daily life, which was something she hadn't imagined doing before having digital access. This creative outlet not only provided personal enjoyment but also garnered social support from viewers, contributing to her sense of achievement and identity beyond her CHW role.

Another emergent benefit was the role of digital media in mental well-being and stress relief. Particularly in Semera/Logiya, where communities have faced conflict and instability, CHWs discovered that online content could serve as a much-needed distraction and source of comfort. This coping mechanism, while not originally an intended use of work-related technology, had become an invaluable personal benefit for CHWs operating in high-stress contexts. Additionally, digital connectivity had unexpectedly fostered a culture of peer support and collective problem-solving among CHWs. For instance, they formed Telegram groups to share work updates and solutions, meaning even isolated health workers could quickly consult others and feel part of a

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Sometimes the community asks difficult questions because they see and learn different things, so during that time we check on Google to answer their questions and sometimes we get surprised. Video makes them eager to learn; they will understand the case after they saw pictures and video. Digital technology helps to facilitate our work and improve communication.”

Birtukan, health worker from Hawassa, shares how digital technology has helped them communicate with their patients better.

extent of digital engagement and its outcomes.

Many CHWs attributed their initial digital access and skills to support from their **networks of family, friends, and colleagues**. Family members often provided the necessary hardware or funds – for example, parents or siblings would buy a first smartphone and even pay for data packages to get them online. This financial and moral support lowered entry barriers, allowing CHWs to explore digital tools early on. Spouses and relatives also acted as informal tech tutors, teaching basic skills like how to navigate smartphones or install apps. One participant from Hawassa recalled that her husband was the first to show her how to use a mobile phone, after which she felt confident enough to start exploring on her own. Friends similarly played a key role by sharing useful information and recommending online content (such as educational pages or Telegram channels) that aligned with the CHW's goals. These peer interactions not only kept CHWs up to date but also encouraged continuous learning. At work, collegial support was invaluable – tech-savvy coworkers would suggest better applications for tasks or help troubleshoot issues (one CHW noted colleagues helped restore her apps when they were accidentally deleted). Altogether, these personal connections created an encouraging environment for CHWs to build digital skills and confidence, directly enabling positive outcomes like easier access to knowledge and broader professional networks.

Regional context influenced the nature of this support. In the urban setting of Hawassa, CHWs more frequently reported substantial family assistance – such as households paying for Wi-Fi and being readily available to answer questions – as well as friends motivating them to pursue online ventures (e.g. helping with video production for a small business). By contrast, several CHWs in Semera faced limited personal resources and often relied on a single key supporter. For instance, one Semera health worker without a smartphone depended on her husband's phone for communicating and filing reports. Others mentioned that while a friend or sibling sometimes sent an internet top-up, they mostly had to fund their connectivity

team. The ease of experience-sharing online was cited as a positive change – CHWs could now easily swap stories and advice with each other, which boosted morale and learning.

8.5.2. Facilitators of positive outcomes

CHWs in both Hawassa and Semera identified a variety of facilitators that helped them achieve positive outcomes from using digital technologies. These facilitators ranged from strong support systems within families, friendships, and workplaces to personal motivation, accessible infrastructure, and the role of digital communities. Additionally, institutional support and informal training played crucial roles in enhancing their digital literacy. The following explores these facilitators in detail, comparing experiences from both regions and highlighting the differences that influenced the

and would go offline when money was tight. Not having a family member to purchase a device was a serious hurdle for some. One participant noted that no one could buy her a smartphone, and she could not afford it on her own, effectively limiting her to basic phone calls with colleagues. These examples highlight that family and friend support, where available, was a crucial enabler of digital engagement; the absence of such support in poorer or more remote contexts often left CHWs struggling to leverage digital tools to the same extent.

The **organisational setting** of CHWs also substantially shaped their ability to achieve positive digital outcomes. Many CHWs benefited from having internet access and IT infrastructure in their workplace or school, which allowed them to integrate online resources into daily activities. As one participant in Hawassa noted, simply having reliable internet at work “*really influenced*” her ability to use digital tools effectively. Work environments that were undergoing digitalisation created natural opportunities for skills development. For example, healthcare institutions introduced systems like electronic health records and online reporting, prompting CHWs to learn how to navigate these platforms. In Hawassa, some respondents described their hospital showing staff how to log in and retrieve information from digital databases – a form of on-the-job technical guidance provided by the institution. Others mentioned that routine duties (such as submitting reports or coordinating with supervisors) increasingly took place via smartphone apps and Telegram groups, which in turn pushed them to become proficient with those tools. Embracing these changes yielded practical benefits: CHWs reported that digital workflows saved time and effort. One midwife explained that because her workdays were so busy, doing tasks like paying fees or sending documents through her phone was a significant time-saver, allowing her to meet responsibilities more efficiently. In both regions, then, the shift toward online communication and record-keeping in the workplace acted as a catalyst for CHWs to improve their digital literacy and use technology to achieve their professional tasks more easily.

Beyond day-to-day tool use, workplaces and affiliated institutions occasionally offered formal resources that enhanced digital capabilities. A few CHWs in Hawassa recalled receiving some training or orientation related to ICTs. For instance, after being hired, one was given four-day’s training in health informatics to familiarise herself with the hospital’s information systems. Another mentioned a half-day workshop on transitioning to a “paper-free” system when her clinic adopted digital record-keeping. These brief interventions, though not extensive, helped build confidence in using specialised technologies. Even without formal training, simply working in an urban, better-resourced setting conferred advantages. Participants acknowledged that being in a city or a modern facility exposed them to more information and know-how than a rural posting would have. In Hawassa, CHWs could tap into institutional communication channels – for example, some hospitals ran Telegram groups segmented by department or cadre, through which they disseminated announcements, guidelines, and urgent updates. One CHW even credited a workplace-linked Telegram channel (“Doctors Online”) with alerting her to a job vacancy that she eventually secured. In Semera, by contrast, CHWs’ workplaces tended to have fewer digital amenities.

Nevertheless, they still leveraged what was available: most were members of an official “family health” Telegram group used by the health bureau to coordinate community health activities, share reporting schedules, and announce training. This ensured that even in remote areas, frontline workers stayed

informed and connected to the broader health system. In sum, the occupational context – including infrastructure, institutional culture, and internal networks – was a key facilitator that enabled CHWs to reap educational and professional benefits from technology.

Outside of their immediate workplace, CHWs in both cities actively engaged with a variety of **online groups, forums, and social networks** that supported their growth. On the professional front, many joined specialised Telegram and Facebook groups to exchange knowledge and find opportunities.

For example, several Hawassa-based CHWs were members of Telegram channels for healthcare professionals. One such channel, “Doctors Online”, focused on posting job vacancies and medical updates; through this channel, a participant discovered a new job opportunity and stayed current on developments in her field. Similarly, CHWs from Hawassa described belonging to alumni and peer networks like a Telegram group for their graduating class (“Hakimichu 13”), where they could see job postings and official announcements from the Health Ministry. There were also niche groups like “Grace”, “Kiki”, and “Zema” – Telegram groups used by doctors and nurses to share information about medications and sources. These professional communities expanded the CHWs’ access to information beyond what their local clinics could provide, connecting them to a nationwide (and sometimes global) pool of expertise. By regularly following these channels (often checking updates daily or whenever notifications came in), CHWs gained timely knowledge about vacancies, research, and clinical best practices. Even those who weren’t very active in posting content found value in “lurking” – simply reading others’ posts. One participant noted that she mostly read the material in a work-related Telegram group that posted training opportunities and health news. However, through it, she had “formed good connections” and stayed aware of important updates that benefited her social and professional life.

In Semera, the range of professional groups was narrower but still impactful. CHWs there primarily used the official work group chats (like the family health group, or a district health officers’ group) to get directives and share field updates. A few also subscribed to broader health networks – for instance, one followed an “Ethiopia Health” Telegram group and the Dessie Hospital Facebook group to glean medical information beyond her region. By participating in these online professional communities – whether actively or passively – CHWs were able to improve their practice (through shared medical knowledge), advance their careers (through networking and job leads), and feel less isolated in their work.

CHWs also derived social, educational, and economic benefits from more general-purpose digital communities. Many engaged with groups that aligned with their personal interests, identities, or side pursuits. For instance, female CHWs who were also mothers frequently visited a popular Facebook group for mothers (referred to as “yenatoch weg,” or “mothers’ page”) to exchange parenting advice and health information relevant to family life. In these spaces, they could ask questions anonymously or read others’ experiences, helping them apply new knowledge at home and in community education. Other CHWs joined youth-focused and local community channels: one Hawassa respondent participated in a Telegram youth association group that discussed youth issues and even held online meetings, allowing her to voice opinions on community initiatives. In Semera, some followed regional groups like an Afar media group or a women’s affairs group, which discuss critical social topics such as female genital mutilation and early marriage – information that the CHWs then utilised in their adolescent health teaching sessions. These online

communities functioned as extensions of the CHWs' training, keeping them informed about social issues and strategies to address them.

Importantly, digital platforms also opened avenues for economic empowerment and learning new trades. A few enterprising CHWs took inspiration from online entrepreneurs by watching business-focused content. For example, one participant described a famous TikTok promoter in Hawassa who advertised local products; by following his posts, she found it much easier to discover goods and services she needed for her small venture. Another CHW, aspiring to improve her income, joined several Telegram channels that sold cosmetics and clothing and even enrolled in an online makeup class she found through these networks. Through the channels, she learned new skills and market trends, which she could leverage for additional income outside her primary health job. In such cases, Facebook and Telegram groups acted as informal training grounds and marketplaces, enabling CHWs to pursue side businesses or personal development goals using knowledge gained online.

Religious and diaspora community groups further contributed to positive outcomes, especially in the social and emotional realm. Many CHWs were active in faith-based online groups – for example, Telegram channels for church fellowships or Islamic study – which provided a source of encouragement and community. Hawassa participants mentioned Christian Telegram groups (such as “K’abod Emanuel Hibret”) where they not only consumed spiritual content but also shared uplifting messages on other platforms like Facebook. These groups often organised online prayer meetings or support initiatives; one CHW noted that her church group sometimes gathered members via voice chat to pray together, which had strengthened her social connections and emotional support system.

In Semera, Muslim CHWs similarly followed religious channels to stay connected with their faith and community, even if they primarily “check[ed] information” and were less vocal in the groups. Participation in such groups had tangible social benefits: it combated the isolation that could come with hard field assignments by fostering a sense of belonging, and it gave CHWs a platform to share and receive guidance on personal challenges. Finally, a few CHWs engaged in charitable or civic-oriented online groups. For instance, there were mentions of a local Dubti charity Facebook group and a national “Youth Voice Ethiopia” group in which CHWs took part to volunteer and discuss social causes. Through these, participants gained personal satisfaction, earned recognition (certificates for their contributions), and widened their social networks beyond their professional circle.

The widespread use of Telegram and Facebook by CHWs in both Hawassa and Semera revealed a clear trend toward digital platforms as essential spaces for community building. These platforms offered a unique blend of professional networking, personal support, and emotional engagement, which has collectively enhanced the educational, social, and economic outcomes for CHWs. By leveraging digital communities, CHWs had been able to access knowledge, job opportunities, and spiritual support, helping them navigate the challenges of their roles while fostering a sense of connection and empowerment.

Formal digital literacy training played a surprisingly limited role in most CHWs' experiences – the majority had no official training on how to use digital tools and instead learned through practice or help from others. That said, a few did receive **targeted support from institutions or educational programmes**, particularly in Hawassa. As part of onboarding at a government health facility, as mentioned, one CHW underwent

dedicated training in health informatics shortly after starting her job. This short course (lasting just under a week) helped her grasp the basics of using electronic health databases and recording systems, indirectly facilitating the positive outcomes she later achieved with those systems. Another CHW mentioned attending a brief “paper-free” workshop when her hospital transitioned away from paper records – an example of how government and healthcare agencies provided in-service training to keep workers up to date with new digital processes. In the educational sector, too, there was an implicit form of institutional support: as schools and colleges modernised, they required students to use computers and internet resources for assignments. One participant reflected that, unlike in the past, nowadays “*everything... is related to technology*” in school, so she had to adapt and learn computer skills to comply with coursework. This early exposure through school became a foundation that later helped her confidently adopt technology in her community health role. Thus, where formal training or structured support existed – via government, NGOs, or schools – it provided a critical knowledge base and comfort with technology that CHWs could build upon.

However, such opportunities were not evenly distributed, and many CHWs identified the lack of training as a gap. In Semera, none of the interviewed CHWs had attended any digital skills training workshop or programme. They entered the workforce with minimal formal instruction in technology, often having to figure things out on their own. Hawassa respondents, while slightly more likely to have encountered some training, also noted that beyond one-time orientation, there was little ongoing support. As a result, CHWs in both regions turned to self-directed learning to fill the void. Some took the initiative by exploring online tutorials and courses relevant to their work – for example, one CHW reported enrolling in various online courses to enhance her professional knowledge, doing so independently because no one else provided guidance. Others learned indirectly through social media; one participant mentioned she “had a chance to learn from TikTok”, picking up tips and information informally via educational videos on that platform. Peer learning was another strategy: CHWs frequently leaned on colleagues or friends for ad-hoc training, asking questions about new apps or digital tasks whenever they arose. Despite the general lack of structured training, the consensus was that digital know-how significantly amplified positive outcomes, and CHWs recognised this. There was an expressed desire for more institutional support in the future. As one respondent put it, staying informed was easier with training, and “*it also helps us if we get training*” on emerging technologies. This suggests that while CHWs have managed to attain benefits from digital tools largely through informal means, they saw formal training and organisational backing as a potential accelerator for even greater educational, professional, and social gains.

8.5.3. Barriers to positive outcomes

Despite numerous facilitators of digital engagement, CHWs in both Hawassa and Semera continued to face significant barriers that limited their ability to fully benefit from technology. While a few CHWs – often those in more favourable circumstances – reported no major difficulties, the vast majority grappled with constraints ranging from infrastructural and financial hurdles to restrictive gender norms and confidence gaps, often deepening exclusion.

Cost and infrastructure challenges remained among the most persistent obstacles. In lower-income or rural settings like Semera, the expense of smartphones and mobile data directly curtailed access. Some CHWs initially had to borrow phones or operate on minimal data plans, limiting their use to the most essential tasks.

Owning additional devices like a laptop or personal Wi-Fi hotspot was out of the question for many, meaning any computer-based work had to wait until they could access a shared device. Helen from Hawassa explained: *"The main challenge is the cost. It is expensive to buy a mobile data package in proportion to my income."*

Beyond individual costs, the lack of institutional support exacerbated these constraints. There was no existing collaboration between the Ministry of Health and Ethio Telecom to offset expenses for CHWs, leaving them to manage costs independently. As one focus group participant from Hawassa suggested, *"To minimise the cost incurred in situations while using digital devices for community health lessons, we can make a collaboration between the health minister's office and Ethio Telecom"*. In addition, CHWs were often responsible for purchasing their own smartphones, a burden especially acute in regions like Semera, where income is low and devices are unaffordable. Unlike in some sectors where government-distributed phones were available, this support was largely absent. As one focus group participant from Semera noted, *"A Smartphone is impossible to access easily... if the government sometimes gives us the package, it will be better."*

Even those with phones often faced unreliable network coverage and frequent power outages that disrupted critical activities, like attending an online training or submitting a time-sensitive report. These infrastructural barriers were further magnified for those with disabilities. Assistive tools such as screen readers, specialised phones, or hearing-compatible devices come with additional expenses, often unaffordable for CHWs with limited economic opportunities. Hawassa participants pointed to Ethio Telecom's discounted packages for persons with disabilities as a helpful measure, but noted that such support was not yet widespread.

Even when devices and connectivity were available, **time scarcity** was a major barrier, particularly for female CHWs juggling heavy workloads and domestic responsibilities. In both cities, participants noted that long hours in the field were followed by household duties, leaving little energy or time for additional digital engagement, such as learning new tools or enrolling in online courses. Hawassa CHWs described household duties as a "second shift" at home, which made it difficult to prioritise non-essential – but potentially transformative – digital practices. As one participant admitted, these challenges were entrenched, and could not be easily changed: *"[After work] we just continue the trend, it's difficult to change."*

Digital literacy and confidence gaps compounded this problem. Some CHWs, especially older ones or those newer to smartphones, expressed hesitation about using unfamiliar apps or platforms. A lack of confidence often kept them tied to using familiar tools, even when better ones were available. Moreover, limited know-how in online safety could expose CHWs – particularly younger women – to unwanted digital risks. For example, one young CHW admitted that her lack of knowledge about social

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Compared to my male colleagues, friends, and family, I face more challenges in using digital tools due to household responsibilities. My husband, for example, can explore technology without the same distractions, while I struggle to find the time and energy.

”

Wibalem, a health worker from Hawassa, compares her experience to male colleagues and families

media privacy settings left her open to unsolicited messages and scrutiny from men online – a form of harassment she noted *“is not common for boys”*. Such incidents further undermined confidence and could make women more cautious about exploring new platforms.

Social constraints rooted in conservative gender norms further restrict digital usage for many CHWs, particularly in Semera. One CHW shared that her husband temporarily prohibited her from using a smartphone due to jealousy and control – an extreme example, but illustrative of how domestic power dynamics can directly negate access. Many others faced more subtle manifestations of these norms. In some households, men were usually the ones who had access to phones or the internet first, meaning women had to wait or curtail their use. Beyond the home, a double standard also applied as one CHW from Semera observed: *“A man can go to an internet café and spend a long time online without any judgment, but if a woman goes... society often assumes she’s there for other reasons.”* Facing such scrutiny, other CHWs reported having to justify their internet use to family members to avoid suspicion, which further discouraged exploration of new tools or platforms.

A lack of content in local languages also emerged as a subtle but important barrier. Much digital content – especially health-related training materials and apps – was in English, which not all CHWs were comfortable using. This was especially true in more rural areas, where limited English proficiency could make key resources inaccessible when local-language alternatives were unavailable.

Some CHWs expressed concerns about **misinformation and trust** online. With an increasing flow of content via platforms like WhatsApp and Facebook, distinguishing credible health information from unreliable or false sources was becoming more difficult. While many CHWs stuck to known and trusted channels, the fear of being misled had made some cautious about using the internet for learning. Without stronger digital literacy skills, this mistrust could discourage them from fully leveraging online resources. Additionally, concerns about privacy and content safety were noted – for instance, a few CHWs described filtering out “disgusting” or disturbing videos that circulated on social media, highlighting the need for improved content moderation to feel secure online.

The **experiences of CHWs with disabilities** underscored how multiple barriers can intersect. A partially blind CHW in Hawassa described how screen-based work strained her eyes, limiting her ability to read long documents or participate in extended online sessions. Even with devices and connectivity available, physical discomfort curbed her engagement. She relied on self-regulation – adjusting screen settings, taking breaks – since no assistive technologies were provided either by her workplace or the platforms she used. Her case highlighted the importance of accessible design, such as screen readers, font adjustment options, or audio-based content, to make digital tools more usable for those with visual impairments. Similarly, a CHW with a hearing impairment in Hawassa pointed out that digital health content rarely included subtitles or sign language interpretation. Most videos and training materials excluded hearing-impaired users by default, leaving them out of opportunities their colleagues could easily access. The group recognised that because accessibility was not built into most health apps or education materials many community members with hearing or visual impairments missed out on key information. These CHWs often faced a compounded disadvantage due to the **intersection of gender and disability**. The Hawassa group emphasised that women with disabilities often confronted dual discrimination: societal expectations around both gender roles and

perceived (in)ability. As a result, disabled female CHWs may be passed over for training or support opportunities, not because of actual limitations, but due to assumptions that they could not manage digital tools or perform at the same level as their peers. Such bias could isolate them from institutional and community support systems, limiting their participation and growth.

8.5.4. Negative outcomes and contributors

CHWs reported fewer negative outcomes from digital technology use. Most described these downsides as manageable, likely because their engagement with technology was more intentional and work-focused. Still, a range of emerging challenges – some subtle, others more direct – were acknowledged.

CHWs noted that **online harassment and abuse was rare**, in part because they deliberately maintained a low profile online. Many chose to share content only within private or professional circles, and some practice self-censorship to stay safe. As Genet from Hawassa put it: *"I haven't faced any kind of abuse, harassment, or scam online, because the things I post are very limited and I am not that much exposed."* While this cautious approach helped avoid unwanted attention, it also revealed an underlying sense that public digital participation carried risk, particularly for women.

Several specific negative experiences were shared, revealing how **digital security** was a challenge for CHWs. One CHW in Hawassa described narrowly avoiding a bank scam after receiving a suspicious message. By verifying it with her actual bank, she avoided being defrauded, but the incident made her more vigilant. In Semera, Aminat, a 27-year-old health extension worker, shared how her Facebook account was hacked, but she regained access with help. Other CHWs expressed similar concerns about account security, describing experiences of being hacked or having personal data accessed without consent.

In Hawassa, Betel, a full-time nurse at a government health institution, explained that repeated Facebook hacks led her to abandon the platform altogether, stating, *"The reason why I stopped using Facebook is because I repeatedly got hacked... different personal things exposed, and different girls get shamed."* This highlights not only the threat to personal privacy but also the gendered consequences, as exposure of sensitive content disproportionately resulted in the public shaming of women. Similarly, Birtukan, a 35-year-old CHW from Hawassa, reported a phone hack that brought negative experiences, reinforcing concerns around data security. Rabia, CHW from Semera, noted, *"They hacked my Facebook account two times."* At the same time, Halima and Mekdes, CHWs from Semera, reported breaches on Telegram and WhatsApp, respectively, which they were only able to resolve with external assistance. These disruptions affected their ability to use key communication tools, risking data loss and eroding trust in digital engagement. Collectively, these incidents underscored how insufficient digital security – paired with low levels of technical support – created barriers to safe and sustained digital participation, particularly for women CHWs.

In addition to security breaches, several CHWs shared feelings of **digital overload**, particularly when professional and personal lives became blurred through constant connectivity. Mobile phones, while enabling efficiency, also meant that CHWs were frequently contacted beyond working hours, with little time for rest or personal recovery. This "always-on" pressure added a layer of mental fatigue, especially among those managing multiple responsibilities at home. This digital saturation, although not immediately described as

harmful, was linked to increased stress and diminished motivation to explore new learning or innovation online.

Exposure to **disturbing or inappropriate content** – particularly on social media – was another concern. A few Semera CHWs described coming across "disgusting" videos or violent images in their feeds. In the words of Halima: *"Sometimes there are disgusting videos and images on Facebook and TikTok; when they come, I remove them from my sight."* While they generally responded by blocking or deleting such content, the experience was still unsettling and reflected the risks of unfiltered content on open platforms. Despite these challenges, most CHWs framed the negatives as occasional and surmountable. They emphasised their capacity to respond – those targeted by scams learned to verify unknown messages, and those exposed to harassment or judgment shrugged it off or adjusted their privacy settings.

Contributors to these negative outcomes fell into several broad categories. **Personal behaviours** – such as poor time management or excessive screen use – could lead to distraction or minor health issues like eye strain. In some cases, **low confidence with digital tools also emerged as a compounding factor**. Several CHWs, especially older ones or those less experienced with smartphones, reported hesitation around using unfamiliar platforms. For them, engaging online sometimes reinforced a sense of inadequacy rather than empowerment.

Platform-related risks was a contributor, including scams and the open nature of digital spaces where harmful content circulated. Some CHWs felt they lacked the necessary digital literacy to navigate complex platforms or verify credible sources, increasing their vulnerability to misinformation and fraud. In a few cases, this led to full disengagement from certain platforms or digital practices altogether. **Social contributors** emerged in the form of bias or judgment, particularly when female CHWs engaged online in visible ways, leading to unsolicited messages or scrutiny that male peers often escaped. This was further reinforced by conservative community expectations, especially in Semera, where women's digital activity may be monitored or restricted by spouses or family members. Some CHWs were expected to justify their online presence, even when it was for professional purposes, leading to self-censorship or withdrawal from certain platforms. These socio-cultural pressures discouraged digital expression and limited access to information or opportunities that relied on open participation.

Finally, several CHWs noted that the **lack of structured institutional support and training** exacerbated these negative outcomes. Without proactive digital literacy programmes, guidance on safe online engagement, or accessible tech support, CHWs often learned through trial and error, sometimes with harmful consequences. Many expressed a desire for tailored training that could help them confidently avoid scams, protect their data, and navigate digital platforms more securely.

8.5.5. Gendered outcomes and barriers

Gender played a nuanced role in shaping CHWs' digital engagement. While many women, especially in more progressive contexts like Hawassa, did not report direct discrimination in accessing or using technology, societal norms continued to influence how freely, frequently, and confidently they can engage with digital tools. In their professional capacity, CHWs were seen as legitimate users of technology, which often shielded

them from overt restrictions. However, in more conservative or rural areas, especially in Semera, deep-rooted gender norms continued to shape both access and experience.

In both Hawassa and Semera, **supportive environments** shaped women's ability to engage with digital tools. Many CHWs credited family and colleagues for easing their entry into the digital world: spouses or relatives sometimes shared household responsibilities, fixed faulty devices, or even bought them a phone, while siblings or co-workers with higher digital literacy acted as informal coaches. In Hawassa, this support was reinforced by urban diversity and the professional legitimacy of the CHW role, which granted women social license to own and use phones. Interviews revealed that some couples even discussed hiring domestic help to free up time for digital engagement.

However, the environments CHWs worked in were not always supportive. In Semera in particular, men were still prioritised for digital access and many women remained tied to domestic duties. In extreme cases, **spousal control over phone access** severely limited digital access. Interviewees described partners who forbid them from joining social media groups, monitored their calls, or banned them from calling relatives abroad. In one extreme case, a woman's husband confiscated her phone for several months, only relenting after she negotiated its return: *"I used the internet a year ago, but I haven't had a phone for the past eight months. I tried to fix my phone, but my husband didn't allow it – he didn't want me calling my siblings who live abroad, and it made him jealous. However, now I've talked to him, and he has permitted me to buy a new phone."* Others said they had to ask permission to use a phone and, when denied, relied on male relatives' devices. Even in less overt cases, women had to **justify their internet use** or request permission to use certain apps. Focus-group participants echoed this dynamic: in Semera, families often prioritised men for phone ownership and claimed that restricting women's access protected them. This expectation kept women offline and underscored how spousal or familial control reinforced gender hierarchies even among employed health workers.

Participants called for broader public-awareness campaigns for men to help normalise women's technology use. They also called for health institutions and telecom providers to supply smartphones, data packages, and tailored training for female workers to improve their careers.

Time poverty rooted in gender roles added a layer of constraint. After full workdays, women were expected to manage cooking, cleaning, and childcare, which meant that digital engagement was squeezed into exhausted evening hours, limiting their capacity for personal learning or leisure. Men, by contrast, could devote more time to learning new apps because they were rarely responsible for household tasks. Participants in both regions noted that this *"second shift"* left little capacity for personal learning or leisure. Semera CHWs observed that men usually used digital tools while women were busy with domestic work, and that this barrier *"mostly affect[ed]"* women due to their heavier home duties. Gender norms also affected **how digital outreach was received**. Participants said that health messages sent via mobile often reached men first, and CHWs had to supplement digital outreach with in-person visits to ensure women received information.

Despite these obstacles, CHWs showed **agency and the ability to adapt** by developing strategies to balance social expectations with personal goals. Many women described negotiating household labour divisions or enlisting the help of partners and relatives to free up time for digital engagement. Others raised awareness within their families, teaching their children about gender equality, and setting boundaries around phone use, while discreetly managing their online presence by restricting contacts or adjusting privacy settings. Focus group discussions revealed broader collective efforts: in Semera, women advocated for men to share digital resources and challenged norms that limited their access. In Hawassa, participants stressed personal development – pursuing training and financial independence – to counter gendered expectations. They urged women to leverage social media to report harmful content and champion their rights, turning digital platforms into tools of resistance.

Participation in women-only groups and online forums were **sources of empowerment**, and helped build confidence, solidarity, and professional networks. Focus group participants noted that when women saw peers confidently using smartphones, it motivated them to learn and raise their social status. Digital tools thus became symbols of independence and equality. They argued that providing smartphones, affordable data packages, and tailored training would give female CHWs the confidence to speak on an equal footing with male colleagues and pursue better-paid roles. Supportive relationships could be key sources of empowerment. Interviewees said that family members and colleagues not only helped with childcare or chores but also encouraged them to explore technology. Sharing household duties allowed some women to reclaim time for online learning and networking. Participants saw a generational shift as younger women adopted phones, but emphasised that continued support from families, communities, and institutions was needed to close the gender gap.

“I used to use internet 1 year ago but now I haven’t had a phone for the last 8 months. I tried to fix the phone, but my husband wouldn’t allow me to have one; he doesn’t want to see me call my siblings who live abroad, and it makes him jealous.

The health worker also added that this restriction from using her phone meant she couldn’t access any of the benefits it could provide. Despite this spousal restriction, she managed to persuade her husband to allow her to use a phone again.

“Sometimes there is cultural barrier; my husband did not allow me to use internet and phone, but now after we discussed, he agreed to let me use a phone.”

A health extension worker from Semera shares a personal story of her gendered challenge around her use of phone and internet

8.5.6. Conclusion

CHWs in Hawassa and Semera had woven digital tools into the fabric of their work and lives, and much of this success stemmed from their own adaptability and peer support. Across both sites, CHWs showed initiative by learning new apps on their own or with a colleague’s help, proving that personal agency and community learning can be just as pivotal as formal training. This human element behind tech adoption underscored a key insight: connectivity’s real impact was unlocked when CHWs took ownership of the tools and when their networks of friends, family, and co-workers encourage experimentation.

At the same time, the stark contrast between Hawassa and Semera highlighted how deeply infrastructure shaped digital engagement. In urban Hawassa, where electricity and internet access are relatively reliable, CHWs confidently used a broad range of platforms – from co-ordinating via e-mail and using Google Drive to exploring new health apps. By contrast, in more remote Semera, connectivity was patchy and power outages

common, forcing CHWs to focus on basic communication. They often had to travel to town or an internet café just to send reports or fell back on pen-and-paper methods when networks failed.

Beneath these regional differences lay common structural barriers that still limited their digital potential. Financial constraints were a recurring issue – many only obtained smartphones or data through support from spouses or pooled resources, making cost a gatekeeper. Meanwhile, formal digital training was largely absent from their professional development, leaving health workers to pick up tech skills informally. While their self-reliance was impressive, those without tech-savvy friends or family were at a disadvantage. These challenges were compounded for CHWs with disabilities, who faced additional costs for assistive devices and often found that software or content was not accessible. In short, unequal access to money, infrastructure, and training meant even the most motivated CHWs could be held back by factors outside their control.

Gender dynamics added another layer that influenced how fully CHWs could benefit from going digital. Female health workers, especially in conservative Semera, carried a double burden of work and home duties, leaving little time or energy for digital pursuits. Some had to justify their smartphone use to sceptical husbands, and others have had devices taken away. Male CHWs, by contrast, used their phones freely and without scrutiny, so they could take greater advantage of available digital tools. This gap even affected their outreach: in communities where many women lacked personal phones, digital health messages delivered by CHWs tended to reach men first, forcing workers to find alternate ways to ensure women got the information. Clearly, gender remains a determining factor in who fully partakes in digital empowerment and who is left on the margins. If these norms aren't addressed, women will continue to lag behind in digital use.

Despite these hurdles, CHWs in both Hawassa and Semera demonstrated remarkable resilience and savviness in navigating the digital realm. They actively developed strategies to manage risks and limitations. For instance, many limited their online sharing to professional or private groups and tweaked privacy settings on social media to avoid unwanted attention – tactics that largely shielded them from the online harassment younger users often faced. When confronted with challenges like scam messages or disturbing content, they responded proactively: verifying suspicious information with trusted sources, blocking or reporting offending accounts, and warning their peers about potential threats. These behaviours reflected a user base that was learning to mitigate digital risks through experience and peer advice. This adaptability was especially encouraging given that widespread smartphone use was relatively new in these areas – it suggested that, even with modest external support, CHWs would continue to adapt and thrive in an evolving digital landscape.

Ultimately, the experiences of CHWs in Hawassa and Semera showed that digital inclusion was a multidimensional process shaped by more than just having a smartphone in hand. Yet these gains remained uneven and fragile as long as deeper structural issues persisted. Bridging the digital divide for CHWs would require holistic solutions – improving connectivity and infrastructure in underserved areas, tackling the social norms that restricted women's digital agency, institutionalising digital skills training and making technologies accessible. Unlocking the potential of digital tools in community health requires investing in the broader ecosystem that enables every health worker to participate fully. The resourcefulness and drive of individual CHWs have laid a foundation; with a more enabling environment, their scattered successes could scale into an inclusive digital transformation in community health.

9. Cross-cutting findings

These cross-cutting findings highlight the key patterns, commonalities, and differences in digital technology use across the four population groups studied – adolescent girls, female teachers, women’s collectives, and CHWs. While each group navigated technology through their own social, occupational, geographical, and cultural contexts, several recurring themes emerged related to everyday use, lived outcomes, enabling factors, and barriers.

9.1. Shared everyday tools and apps

Mobile phones were the most commonly used digital devices across all groups. They were used mainly for communication, access to information, and daily tasks related to the participants’ respective professions. Although some participants mentioned owning additional devices, such as tablets and laptops, phones appeared to be the most versatile tools used to navigate their everyday technological needs.

For **both personal and professional communication**, messaging apps and social media platforms emerged as the most frequently used applications across all population groups.

Telegram, WhatsApp, and IMO were the most widely used apps. Most participants reported belonging to broader professional and social groups or channels on Telegram that helped them stay up to date on relevant topics.

Facebook, TikTok, and YouTube were the most common platforms, primarily used for entertainment, information, and social connection. While there appeared to be a slight generational difference (i.e. the younger generation preferred TikTok more than the older generation) the findings show that these social media platforms were considered essential and used daily.

9.2. Shared positive outcomes

Improved access to resources such as educational and informational content, including self-directed learning and professional development through platforms like YouTube and Google, and using AI tools (e.g. Chat GPT and Gemini) was a key shared positive outcome. This was especially prominent among students and teachers who felt that these tools and platforms filled in a significant resource gap for teaching and learning complex subjects and topics.

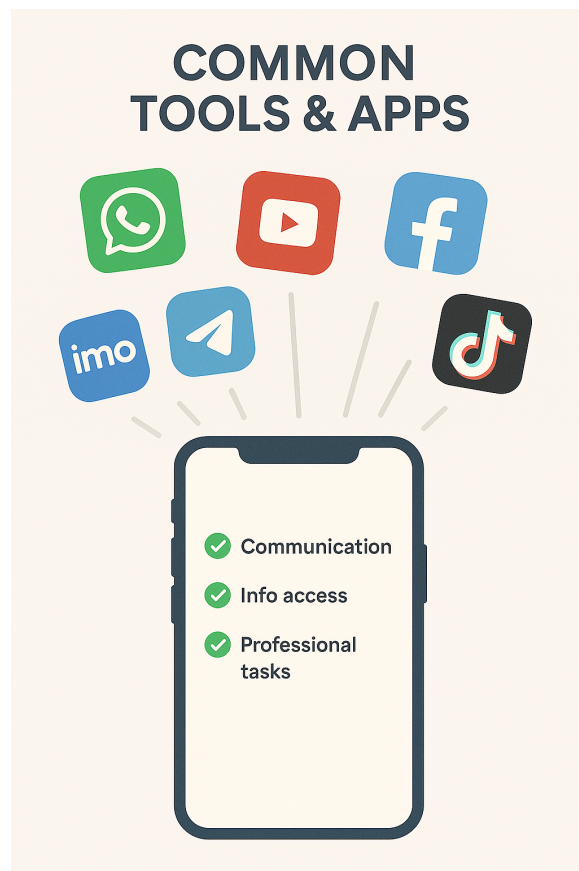


Figure 15: Commonly used apps and purposes across all population groups

Enhanced communication and social connectivity via messaging apps (e.g. WhatsApp, Telegram, IMO), especially for maintaining ties with distant family, friends, and work networks, was raised by almost all respondents.

Greater efficiency and convenience in professional tasks and daily responsibilities, such as lesson planning, documentation, and financial transactions were reported by most participants.

SHARED POSITIVE OUTCOMES



Improved access to resources



Enhanced communication and social connectivity



Greater efficiency and convenience



Ease of financial transactions and management



Increased personal empowerment



Expanded access to economic and entrepreneurial opportunities



Digital inclusion for individuals with disabilities

Digital engagement **increased personal empowerment, confidence, and autonomy** including by providing a space for self-expression, exposure to role models, and participation in supportive online communities. This provided a stronger sense of belonging and solidarity in gender supportive or disability-focused digital spaces (e.g. women-only channels, disability advocacy groups). Online communities mentioned by blind teachers were especially important, offering a space for networking, and learning about new assistive technologies as well as useful hacks from other blind teachers.

Expanded access to economic and entrepreneurial opportunities, such as online sales, freelance work, or digital marketplaces, was noted, especially by urban youth participants and some Hawassa SHG members. These included adolescents in Addis Ababa and the Gorzo collective in Mekelle who were engaged in different types of platform work. Some participants from the SHG in Hawassa mentioned using online marketplaces – such as Facebook and Telegram – to sell clothes for their micro-businesses.

Figure 16: Common positive outcomes across all population groups

Digital inclusion for individuals with disabilities through using assistive technologies like JAWS, TalkBack, and NVDA, and engaging in supportive online communities was also a shared positive outcome. This was also a positive outcome for CHWs who engaged with patients with visual or hearing impairments. Such technologies presented more independence and efficiency in the everyday life of people with disabilities with a number no longer having to rely on others to do certain tasks. For instance, teachers and students mentioned how they could easily transcribe braille or use audiobooks/readers instead of depending on others to make voice recordings of essential materials.

Prior research underscores the importance of inclusive digital strategies for marginalised groups, including persons with disabilities, to bridge the digital divide (Adam et al., 2024). The findings reinforce this priority: visually impaired participants reported that assistive tools significantly enhanced their independence,

enabling them to access information, communicate, and complete professional tasks without constant assistance.

9.3. Shared facilitators and barriers to positive outcomes

Across all groups, **access to a digital device and internet connection** – whether personal or shared – was consistently identified as the first enabler of meaningful digital use. **Peer support networks**, whether friends, colleagues, or family, also played a critical role in building confidence, sharing digital know-how, and exploring new technologies.

Motivation, curiosity, and a drive for self-improvement further shaped engagement, especially among adolescents and teachers.

Community-level enablers, such as Wi-Fi at schools, training within women’s collectives, and supportive school or clinic environments, were particularly valuable for sustaining digital practices.

Participants with visual impairments also cited **the availability of assistive tools like screen readers** as essential for inclusion.

At the same time, a set of structural and social barriers consistently limited positive outcomes:

Economic constraints, particularly the high cost of data and quality devices, were frequently cited, with users often relying on low-capacity or outdated phones. The literature emphasises that Ethiopia remains one of the most expensive countries globally for mobile data in relative terms, with 1 GB consuming 9.65% of monthly Gross National Income – far above the ITU’s 2% benchmark – and smartphones costing approximately 25% of a person’s monthly income (FDRE, 2020; Gillwald & Partridge, 2024; Adam et al., 2024). As a result, an estimated 84% of Ethiopians cannot afford a smartphone (Adam et al., 2024). Our findings align with this, as many participants noted they relied on basic or outdated phones and restricted data use to essential functions.

Infrastructure challenges, such as weak networks and frequent power outages (especially in Semera and Mekelle), made regular engagement difficult. Prior studies have shown that limited electricity access and unstable networks – particularly in rural Ethiopia – significantly hinder consistent connectivity (Adam et al., 2024; Warner et al., 2023; Asrat et al., 2024). These infrastructural limitations remain acute despite near-universal 3G coverage and urban-focused 4G rollouts. Our findings echo this, with participants in remote areas



Figure 17: Shared positive outcome facilitators and barriers

such as Semera and Mekelle describing weak network coverage and frequent power outages as persistent barriers to sustained digital engagement.

For people with disabilities, **many platforms and apps were inaccessible**, and in some cases, key functions like mobile banking or digital content lacked inclusive design.

A lack of formal digital training meant that most users had to rely on trial and error or informal guidance, which left gaps in more advanced digital skills, especially among older participants. Literature shows that 25% of Ethiopians are unaware of the internet and 30% lack the skills to use it effectively, with women disproportionately affected (Adam et al., 2024). Even when access is achieved, limited digital literacy prevents users from maximising potential benefits. This aligns with our data: most participants had no formal digital training and learned informally, leaving them vulnerable to misinformation and scams, and resulting in tools being underutilised.

Gendered time poverty was also a significant factor, with domestic and caregiving responsibilities disproportionately limiting women's time to explore or benefit from digital tools. Research documents stark gender disparities in digital access, with only 6% of Ethiopian women owning a mobile phone compared to 33% of men, and one-third of married women reporting no access to a mobile device – twice the rate of married men (Warner et al., 2023). These gaps are linked to structural and socio-cultural inequalities, especially acute for rural women whose access is limited by infrastructural deficits, lower literacy, and rigid gender norms (Adam et al., 2024; Gillwald & Partridge, 2024). Our findings mirror these trends, as women's use of technology was often constrained by both material scarcity and restrictive household dynamics.

In more conservative households, adolescents and women, particularly CHWs in Semera, faced scrutiny or restrictions that shaped how, when, or whether they could use digital tools at all. Studies highlight that entrenched gender roles, **socio-cultural expectations**, and household power dynamics restrict women's independent digital participation, particularly in rural and conservative communities (Adam et al., 2024). Our findings confirmed this, as women in such contexts reported close monitoring, restrictions on device use, and self-limiting online activity to avoid familial or community disapproval.

9.4. Shared negative outcomes and contributors

The study also revealed a range of contributors to negative digital experiences across the groups.

Scams and misinformation, especially against older or less digitally literate users, were raised. This was mostly associated with a lack of awareness or support around online safety.

Online harassment and unwanted advances from men were also mentioned, especially among adolescent girls. These effectively made women and girls shy away from being more visible online, whether for self-expression or other professional pursuits. Studies by the Centre for Information Resilience (CIR, 2024a; CIR,

2024b) reveal widespread gendered online abuse in Ethiopia, where harassment and threats lead women to reduce or withdraw from online participation. Our data supports this: adolescent girls and women engaged in advocacy described unwanted advances and online harassment that deterred them from visible digital engagement, highlighting the need for robust safety measures.

The physical and mental toll of digital life was also clear. These included eye strain, sleep disruption, emotional exhaustion, and social isolation which were cited frequently, particularly by visually impaired users and adolescents navigating intensive online environments.

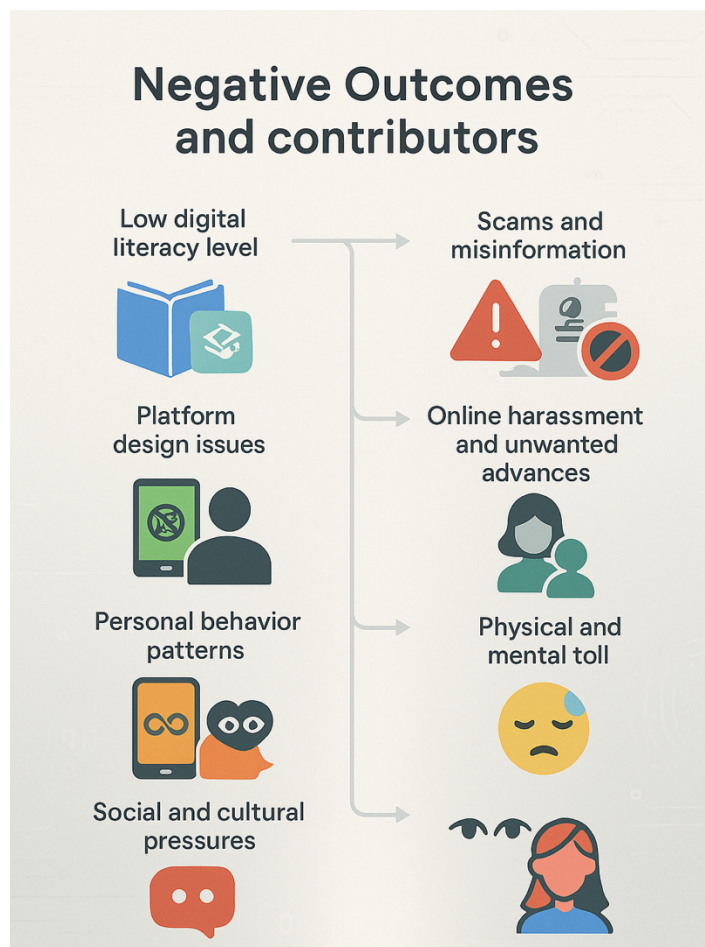


Figure 18: Common negative outcomes and their contributors across all population groups

While the main contributors to these negative outcomes were compounded by structural, systemic, and personal factors, the common contributors across the population groups included:

Platform governance gaps, such as a lack of content moderation and poor security features, enabled exposure to harassment, scams, and harmful content. This was particularly concerning for adolescent girls and women's collectives engaged in public advocacy, who described being targeted or choosing to self-censor as a result.

Personal behavior patterns and the addictive nature of some platforms also contributed to digital fatigue; many participants, especially adolescents, described spending too much time scrolling through social media, which led to distraction, sleep loss, or feelings of guilt.

Social and cultural pressures further complicated digital life; participants feared being judged, policed, or misunderstood, which often

limited the nature of their engagement to basic everyday communication and functions directly related to their livelihoods.

10. Recommendations

While these recommendations reflect recurring patterns and concerns raised across groups. Rather than offering prescriptive solutions, they are framed as practical entry points for strengthening digital inclusion through context-aware and community-informed approaches. Each point draws directly from lived experiences shared by participants and is intended to guide future programming and policy dialogue.

- **Invest in robust digital infrastructure (especially in rural and post-conflict areas)** by expanding electricity and internet coverage. Provide backup power solutions and free or low-cost Wi-Fi in schools, health posts, and community centres where women and girls can have consistent connectivity in safe and accessible locations.
- **Make digital devices and internet access more affordable** through subsidies and targeted discounts. Support women and girls in gaining access to smart and assistive devices through financial mechanisms, including mechanisms set up by community-based institutions.
- **Ensure digital access initiatives are inclusive of people with disabilities.** This means ensuring not only improved access to assistive devices and software but also requiring that critical platforms – such as mobile banking and money transfer apps – meet accessibility standards as a condition for licensing.
- **Integrate comprehensive digital literacy programmes** into formal education and community training. Use practical, hands-on approaches to cover everything from basic device use to advanced skills. Curricula should include topics such as how to participate in online courses, how to conduct research online, digital entrepreneurship, and platform work to build confidence to use technology across education, employment, and everyday life.
- The **ethical and effective use of AI tools** should receive critical attention in training programmes, especially as the use of these tools is already growing. Starting conversations around the ethical use of digital technologies early on is essential, given the potential of these tools to do both harm and good. Early engagement helps ensure that the adoption process itself remains healthy and carries less risk.
- **Provide dedicated training on online safety and cybersecurity** through existing institutions and support networks. Cover topics like protecting privacy, avoiding scams and misinformation, and handling cyberbullying or harassment. At the same time, enforce strict anti-harassment policies in schools, workplaces, and community groups and create clear reporting channels to keep digital spaces safe and welcoming. As seen in the findings, women with lower levels of education, as well as older women, are systemically excluded from accessing digital literacy training. Thus programmes directed towards improving online safety and security that make intentional efforts to include such women by providing tailored support should serve as a strategic entry point for non-government actors, such as civil society organisations and international support agencies. They should lead in implementation, design inclusive interventions, and collaborate with existing peer networks identified in the research as effective platforms for support and learning.

- **Establish peer mentoring networks** by designating tech-savvy “digital champions” or buddy systems within schools, workplaces, and community groups. These networks allow women and girls, as well as excluded men and boys, to share knowledge, troubleshoot issues together, and narrow down the digital divide.
- **Engage families and communities** to support the digital participation of women and girls. Organise community dialogues, school workshops, and public awareness campaigns with parents, spouses, and local leaders to challenge restrictive gender norms and highlight how women’s digital inclusion benefits the entire family and community.
- **Address structural time poverty** by ensuring women’s needs and constraints are considered from the start. This means offering tailored support that reflects cultural, social, and economic realities – whether flexible training schedules using existing community platforms like Telegram, or integrating digital literacy training into routines women already follow.
- **Strengthen political and social will** to confront the structural barriers that shape women’s access to digital tools. This includes advocating for policies that redistribute unpaid care work, challenging harmful gender norms, and committing to long-term investment toward equitable digital access.
- **Design digital tools for low-resource settings** by using a mobile-first approach and building in offline capabilities. Deliver content in local languages and user-friendly formats to reach women and girls with limited connectivity or literacy.
- **Promote digital entrepreneurship and economic opportunities** for women and girls. Offer training in online business skills (like marketing, e-commerce, and digital finance) and link women’s groups and female entrepreneurs to broader networks and markets so they can turn digital skills into better livelihoods and greater influence.
- **Position communities as co-creators of programmes.** Across all groups, participants had important experiences to share. Their lived experience of navigating digital tools is a resource – from challenges like fatigue, harassment, cultural barriers, and accessibility gaps, to innovating creative uses in education and health, and for income generation and advocacy. These insights highlight the importance of moving beyond consultation into true co-creation. These women are not just users but active space makers whose experiences should shape the design, delivery, and evaluation of future programmes and inform the design of technology.

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