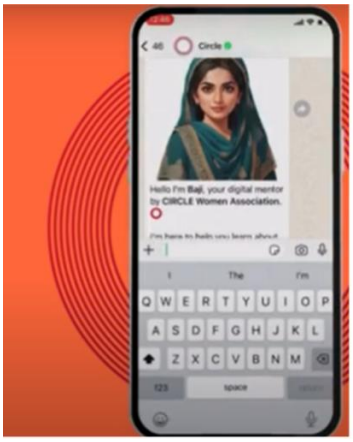
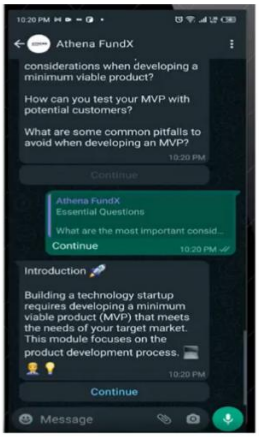
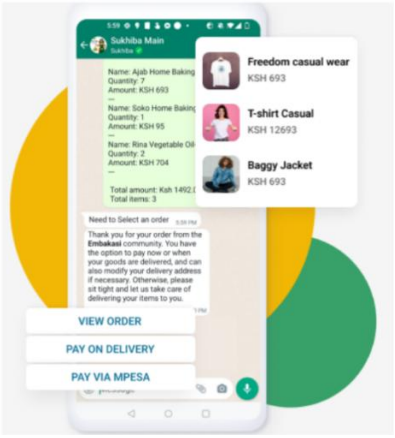
The impact of digital upskilling on women-led small businesses and low-income women entrepreneurs:

Insights from literature and donor-funded initiatives









Paper Submitted for [NBER, Gender in the Economy: Women in the Digital World]

Authors
This paper was written by Savita Bailur, Janet Shulist, and Marius Karabaczek from Caribou Digital.

Acknowledgments
The authors note that this research was supported by:

- Mastercard Strive, a portfolio of philanthropic programs supported by the Mastercard Center for Inclusive Growth and funded by the Mastercard Impact Fund.
- The Gates Foundation Women's Economic Empowerment Team. Caribou Digital is a Learning Partner for the WEE team's gender, digital tools and markets portfolio.
- No other conflicts of interest

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Cover page images clockwise left to right: Interfaces from Circle, AthenaFundx, Arifu, and Sukhiba, all dedicated to W-MSEs and low-income women entrepreneurs, in Pakistan, India, and Kenya (last two images), respectively. Note that all have multiple language options, but we have taken the English versions to illustrate content. These screenshots are shared with consent.

Abstract

Micro- and small enterprises (MSEs) are vital to emerging economies and often provide substantial livelihoods for women who cannot otherwise enter the formal workplace. However, these women and women-led micro- and small enterprises (W-MSEs) may struggle with growth and productivity due to limited knowledge and skills, particularly in a digital age. Effective digital upskilling programs can reduce the digital divide and contribute to women's increased income generation, livelihoods, and agency. Yet gender gaps in access to digital tools and devices, while narrowing, can hinder W-MSEs' ability to benefit from digitally delivered upskilling in the same way as men. Careful digital program design and implementation that address the needs and constraints of W-MSEs can positively impact how W-MSEs learn, adopt, and benefit from digital upskilling initiatives. This practitioner-led paper offers lessons for designing and implementing digital upskilling interventions for W-MSEs and low-income women entrepreneurs. The authors are from Caribou Digital, a digital economy consultancy that implements programs for clients, including the Mastercard Center for Inclusive Growth and the Gates Foundation. The latter are among donors applying a gender lens in their digital initiatives, particularly for W-MSEs. In this paper, we share what we have learned about how digital upskilling is leading to positive outcomes and impacts for W-MSEs across the globe, both from literature and from the programs we engage with. These lessons include understanding the importance of tech and touch, gender-sensitive user-centered design (such as reminders and incentives), tailored content (which generative AI can assist with), bundling training content to make it more effective, and using social media to benefit from "ludic learning." We close by proposing the consideration of the Gender at Work framework, a taxonomy of digital skilling for those looking to implement digital upskilling initiatives for W-MSEs.

Introduction: W-MSEs and low-income women entrepreneurs benefit from digital upskilling

"I like using WhatsApp to sell vegetables. Before I had a torch phone [literal translation of a non smartphone], I could only call the customers whose numbers I already had. Now with this M-KOPA phone, I take a picture of what I have for the day, put it on my [display photo], or I will message everyone to leave a voice message: 'Hey, this is what I have, this is the price per kilo, etc.' Sometimes they send it to others. Sometimes if it's a busy housewife, she will say can I clean and prepare the vegetables. So I do that, send her another photo when it's ready, and she comes and picks it up on her way back from work."

—Ruth, vegetable seller in Machakos County, Kenya

Ruth was one of the low-income vegetable sellers we interviewed in Machakos County, Kenya, located about two hours from Nairobi in 2023. Ruth's interview was part of research to

understand the baseline digital skills of W-MSEs and entrepreneurs[1] and their upskilling needs for an intervention with M-KOPA smartphones. M-KOPA is an African-connected asset financing platform that provides smartphones to underbanked customers. The intervention specifically examines the impact of digital tools (in most cases, smartphones) on women entrepreneurs and MSEs. However, what was unclear was a) what level of digital literacy Ruth already possessed, b) what she would need to accelerate impact on her business and livelihood, c) how she learned these digital skills, and d) what would be effective upskilling methods for her.



Ruth (seated) and the research team. Machakos County, March 2023.

W-MSE owners and entrepreneurs, like Ruth, are vital to emerging economies and often provide substantial livelihoods for women who cannot otherwise enter the formal workplace. Digital tools, particularly low-cost smartphones, provide a potential source of income to many such women. However, these women and W-MSEs may struggle with growth and productivity due to limited knowledge and skills, particularly in a digital age. If taught in school, IT skills are usually irrelevant for mobile-based income generation. While digital training does exist, such as

[1] Note that in this paper, we address both W-MSEs and women entrepreneurs. The distinction between the two is for another discussion, but our research shows that there is a blurring of the two depending on market needs—women formalize into an MSE but also sometimes work on their own to "hustle."

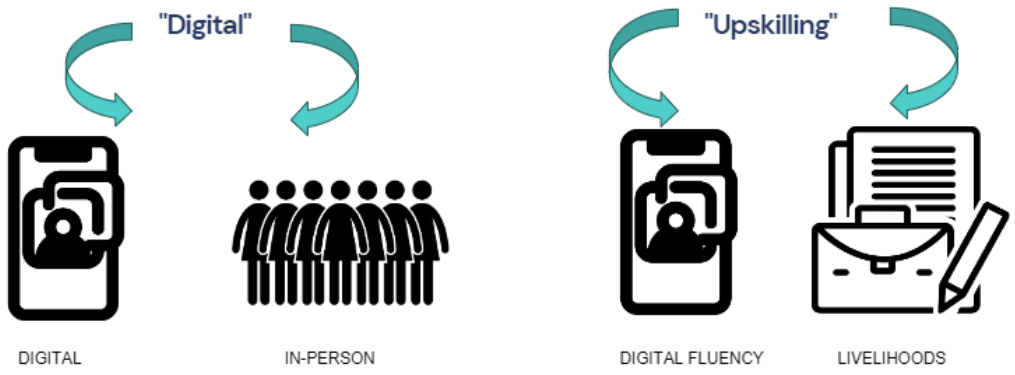
GSMA's MISTT train-the-trainers curriculum, many users prefer tailored and peer-to-peer learning.

The case for digital upskilling

Evidence suggests that effective digital upskilling programs can improve MSEs' and entrepreneurs' digital skills and, in theory, contribute to women's increased income generation, livelihoods, and agency. There is existing evidence that improvements in management and business practices can lead to significantly better outcomes for micro-enterprises (McKenzie & Woodruff, 2016). While sub-Saharan Africa is the only global region with more female than male entrepreneurs, many W-MSEs earn 34% less profit than their male counterparts (Asiedu et al. 2023).

In this paper, "digital" refers to digital content delivered digitally and/or in-person (mediated), while "upskilling" refers to increasing or enhancing digital skills and/or broader business-related skills (Figure 1).

Figure 1: Visual depiction of how this paper defines digital upskilling



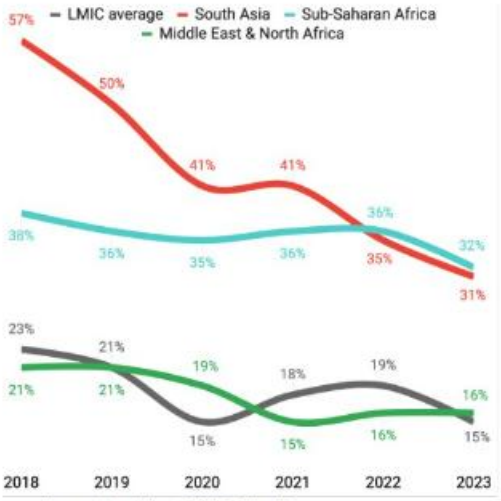
Source: Caribou Digital

To borrow from communications theorist Marshall McLuhan's "medium is the message" axiom, digital upskilling is *both* the medium *and* the message. Therefore, while the *content* of digital upskilling may be on digital topics (e.g., how to navigate your smartphone, how to protect your privacy and security, how to sell online), digital is also the *means* to teach that content (i.e., digital is becoming a more relevant channel to deliver upskilling to W-MSEs). Teaching women how to use smartphones could help decrease the gender digital divide. As noted by the GSMA's Mobile Gender Gap Report (GSMA 2024), women's rate of mobile internet adoption has increased steadily over the past few years across low- and middle-income countries (albeit with a likely COVID-related dip in 2021 and 2022), and there are now more women using mobile internet than ever before. However, there remains a marked difference between access and ownership of a smartphone, and active use of a smartphone. Figure 2 shows the difference in

Kenya between a woman's ownership of a mobile phone and "diverse daily use" (defined by GSMA as performing at least three diverse mobile tasks daily).

Figure 2: Integrated view of the gender gap in mobile internet usage over time (%, 2018–2023) alongside the gender gap at various stages of mobile internet use for women in Kenya (%, 2024).

While the gender gap is closing....



Source: adapted from GSMA, 2024, p. 16

... it widens along each step of a woman's journey (GSMA, 2024)

Stage of Mobile Internet User Journey (Kenya)	Gender Gap (%)
Mobile Ownership	1%
Mobile Internet Awareness	5%
Mobile Internet Adoption	32%
Daily Mobile Internet Use	36%
Diverse Daily Mobile Internet Use	43%

Source: adapted from GSMA, 2024, p.23

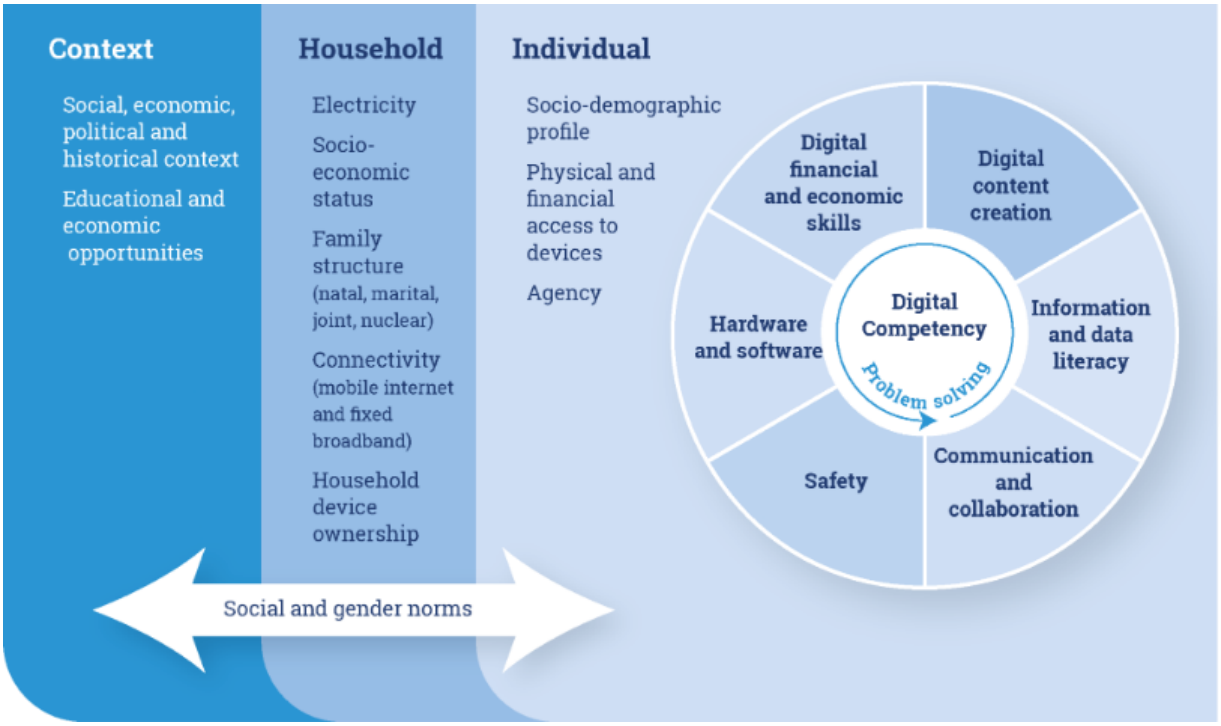
Source: Data adapted from GSMA, 2024

Digital upskilling is critical for women entrepreneurs and MSEs to move along the mobile use pathway. Digital technology can reduce costs to deliver upskilling and extend its reach (Fuchs et al. 2023), and when done well, has the potential to move women along this pathway to active mobile use.

Yet, *what* a training curriculum might look like and *how* it is embedded into a broader context also needs to be considered. Building on the European Union's DigComp Framework,[2] University of Cape Town researchers have developed a framework of digital competency at the individual level, highlighting both context and household elements, in addition to social and gender norms. As referenced in Figure 1, however, these competencies can (indeed, should) be delivered both digitally and in person—a key insight discussed below.

[2] DigComp is in the process of being refreshed to reflect more mobile use, illustrated in Figure 3.

Figure 3: Digital Competencies Framework adapted by the University of Cape Town



Source: Presentation, "Enhancing metrics for measuring digital access and use," April 2024, University of Cape Town, Johns Hopkins University, and 2x

Methods

Drawing on the methods outlined below, this paper shares findings on the existing levels of digital skilling and respective needs for W-MSEs and entrepreneurs, as well as the impact of digital skilling from literature, followed by insights from donor-funded programs (see Appendix A for the list of initiatives). The paper concludes with a digital taxonomy for those considering the implementation of digital upskilling for W-MSEs.

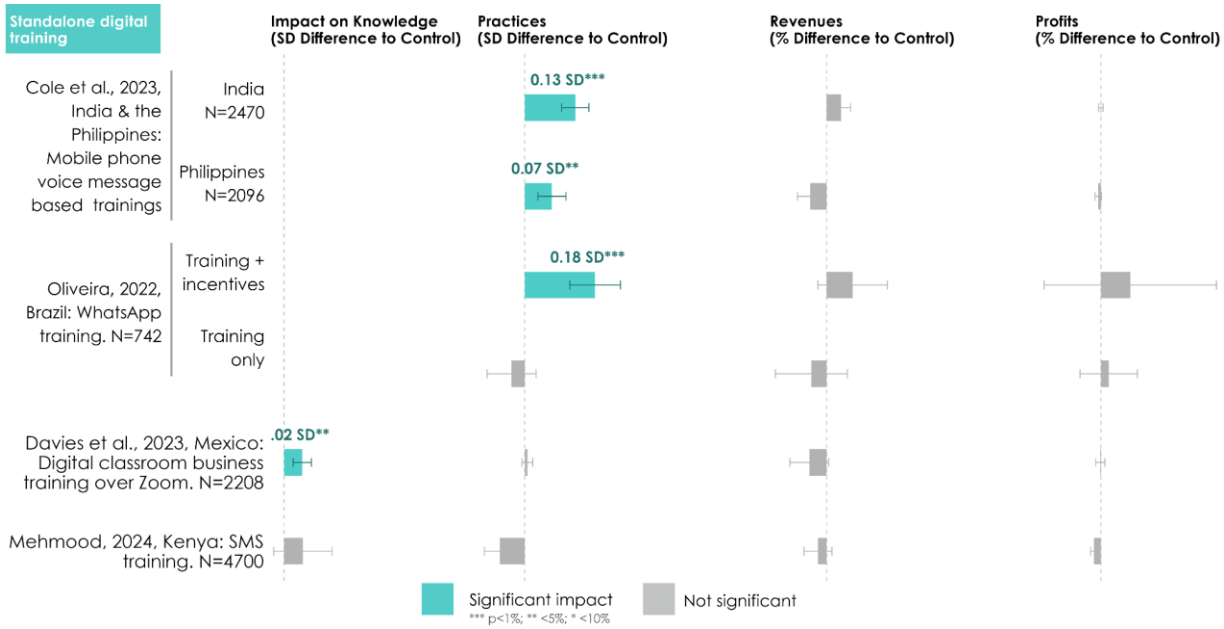
We draw from the following resources:

- A literature review from 2010 to present day on digital upskilling in W-MSEs in emerging economies/the Global South, including 19 randomized controlled trials (RCTs) on upskilling (most not gender-disaggregated). A key resource for the literature review was the Mastercard Strive Small Business Evidence Map
- Learnings from donor-funded initiatives with a digital upskilling focus in sub-Saharan Africa, South Asia, and Latin America (see Appendix A for more information on initiatives). Learning was gathered through key informant interviews (including with donors, implementing partners, policymakers, and small business users of digital solutions), focus group discussions, and mid-line as well as end-line evaluation documentation.

Insights from literature and donor-funded digital upskilling initiatives for W-MSEs and entrepreneurs

We now turn to the causal impact of digital upskilling and the lessons we've derived from the literature and our own experiences with digital upskilling programs for W-MSEs. Our initial scan on non-gender disaggregated digital upskilling for MSEs (Mastercard Strive 2024) showed that while digital upskilling does enhance performance, delivered *on its own* it rarely supports long-term impacts such as more profitable and resilient businesses, more efficient operations, or new work opportunities (Mastercard Strive 2024). Four randomized evaluations in five countries on the impacts of standalone digital training through various channels on low-income, mostly female entrepreneurs found no impact on revenues and profits (see Figure 4). There is evidence of small to moderate effects on knowledge and business practices, particularly when training includes regular reminders and incentives.

Figure 4: Four randomized evaluations of digital upskilling and its identified impacts



Source: Caribou Digital analysis of identified evaluations

However, when digital upskilling programs for W-MSEs are designed thoughtfully with key considerations in mind, the literature finds causal evidence for improved business impacts and outcomes. This includes digital upskilling programs that balance tech elements with human touch, leverage tailored one-to-one support, bundle or embed upskilling content into existing relevant digital products or solutions, integrate reminders and incentives, and/or design upskilling content that is peer-led, short, and timely. Below, we outline these lessons further, highlighting the impact and outcomes from the literature, where available.

Above all, a mix of “tech and touch” is critical.

It is tempting to turn to digital upskilling as a cost-saving solution compared to in-person training. After all, a key advantage of digitally delivered training is scale and speed. However, as noted in the literature, online training typically has low completion rates (see, for example, Yeoman and Reich 2017). In China, a large RCT involving two million merchants on a digital platform found that 45% of platform sellers browsed any training content, 24% started at least one training task, and just 13% completed a task (Jin and Sun 2021). Similarly, the founder of Arifu, a digital training company working with W-MSEs, states: *“It’s easy to think of fully digital training as zero dollars spent other than content development. But in reality, it will only work with some level of in-person contact.”* Mediated training offers the opportunity for W-MSEs to interact, ask questions, and learn from the trainer, as well as their peers when offered in a group setting. In the same Machakos County research where we spoke to Ruth, we noted that M-KOPA agents invited for a focus group spent significant time showing each other phone functionality and helping each other out organically. This peer-to-peer training and support is what is needed to complement digital training. Shomvob, a job-matching platform, invests a great deal of time in training women jobseekers on how to navigate the platform, a tactic that has borne fruit as the number of women users of Shomvob has steadily increased.

Figure 4: An introductory Q&A session on digital tools by Shomvob in Bangladesh. No digitally mediated training was introduced at this stage.



Source: Fabliha Mahfuz, Shomvob

Tailored one-on-one support improves business practices and outcomes through personalized guidance that one-size-fits-all programs can't match.

Following on the importance of tech and touch, we reiterate that, although it is costly and more time-intensive, human interaction and tailored advice continue to be important for positive digital upskilling outcomes (Mastercard Strive 2024). Literature finds causal evidence that digital mentoring leads to increases in women entrepreneurs' revenues and profits of 18% to 20% on average (Mastercard Strive 2024). In one study, women entrepreneurs showed large and significantly improved outcomes when matched with a female mentor, but not when matched with a male mentor (Germann et al. 2023). Another study found that more time and cost-intensive mentoring (on- and offline) improved female entrepreneurs' marketing practices and customer service, tending to drive higher revenues (Anderson and McKenzie 2020).

In Indonesia, Tumbu Accelerator worked with more than 6,000 small businesses (the majority were W-MSEs) through small facilitated WhatsApp-based groups. Mentors advise each business owner on specific training content, hold Q&A sessions, and guide business owners through a series of tasks to practice new skills. To increase participation, the program also offered incentives (digital money/phone credits, social media promotion of their businesses) for completing courses and assignments.

Within programs, we also noted higher uptake and favorable response by W-MSEs when digital upskilling is included with mentoring and other human touchpoints, particularly on post-training support groups and market linkages (discussed further in the next section). This is supported by literature (for example, Asiedu et al. 2023). For instance, MESH (a Kenya-based social networking initiative spun out of Shujaaz Inc, aimed at young people) provided linkages to jobs and training on job platforms and networks (60db 2024). A majority (94%) of respondents in a 60dB phone survey said they grew their business because of MESH, 90% said their income had increased, and 32% said it increased by more than 50% (60db 2024). The majority of this is attributed to clear, targeted content with relatable use cases and entrepreneurs (e.g., hairdressers, retailers). One other finding from MESH was a significant jump in female participation on the online platform when MESH deliberately worked with more female moderators and mentors rather than men (Miltenburg 2024).

From this causal evidence and our program insights on digital upskilling, we note that initiatives should address low-income women entrepreneurs' needs and constraints through multiple forms of support. This can include elements of personalized access to learning through mentorship, fostering professional networking opportunities, and encouragement of and guidance on e- and social commerce to take advantage of digital markets.

Digital upskilling is more effective when bundled or embedded with other digital products and services because it supports the immediate application of learning.

Programs that bundle digital upskilling with other elements of support, such as e- and social commerce platforms and online professional networking, can improve business practices, reduce usage frictions, and enhance outcomes for low-income women. For example, one RCT with Jordanian women entrepreneurs tested the impact of Facebook business page support and digital marketing training. Beyond doubling their use of Facebook business pages for marketing, women entrepreneurs in the treatment saw increases in client numbers, weekly revenue, and overall business performance (Alhorr 2024). These effects were strongest for women with greater social mobility restrictions. In Mozambique, bundling financial management training and mobile money access resulted in a significant increase in profits for W-MSEs but not for men, narrowing the gender gap in profit (Batista, Sequeira, and Vicente 2021).

When not bundled with other support levers or embedded in digital products and services, digital upskilling is more likely to lead to negative or null outcomes for small businesses (Mastercard Strive 2024). A study involving women micro-entrepreneurs in Tanzania showed that women who received both training and access to a mobile savings account saved 35% more than those who were given only accounts (Bastian et al. 2018). Our work with Arifu, MESH, Circle, and others has consistently illustrated that to increase its effectiveness, digital upskilling should be bundled with or embedded in the user journeys of new or existing digital products, services, and platforms.

Bundling is a key differentiator of digital as it can more easily deliver support at the right time and in the right combination for small businesses. Two-thirds of the women-focused studies in the Mastercard Strive Small Business Evidence Map represent bundled support. These studies have shown that the combination of different elements of digital upskilling, digital financial services, and/or market access digital tools can lead to a positive impact on business revenue — with women-owned small businesses reporting an increase in revenue between 30% and 80% (16 studies cited in Mastercard Strive 2024).

Bundling digital upskilling with other forms of support, such as online networking and business development support can increase take up and completion rates because women see a purpose in the training. For example, Arifu uses automated SMS Business Training for Livelihoods to connect at least 250,000 women to bundles of financial and market access with tailored enterprise and business skills training. Further, embedding small business upskilling content and solutions within partner-owned apps or platforms leads to higher conversion rates for small businesses (Mastercard Strive internal evaluation 2024).

User experience, reminders, and incentives can improve digital upskilling engagement and completion.

Incentives and reminders can lead to increases in learner engagement—addressing some of the completion challenges created by a lack of physical interaction within digital upskilling (Mastercard Strive 2024). In Brazil, an RCT among mostly low-income W-MSEs showed that a WhatsApp training course paired with monetary incentives and nudges increased both engagement with training content and adoption of marketing and recordkeeping practices and had a positive impact on firm survival. Without incentives, the training had no effect (de Oliviera 2022). Equally, Boost Technology (2024) found that, of W-MSEs who received insight-based digital nudges, 90% reported income increases. Other initiatives, including those with MESH, M-KOPA, and Arifu, reported user-centered design as critical to success. M-KOPA noted in field studies that when designing digital upskilling for agents for their "M-KOPA Academy," small but powerful insights helped improve "stickiness." For example, in UX (user research) testing of the M-KOPA Academy interface, M-KOPA noted that users preferred a combination of written English and Swahili audio voiceover, as first, users felt written Swahili is difficult to read and second, they felt that reading written English improved English skills.

However, better user experience, nudges, and incentives raise three issues for those implementing digital upskilling. First, it is a challenge to find developers and designers who both understand the low-income demographic and the high cost of mobile data and are able to design at the right level. Second, there is a possibility that donor-funded projects may pay lower than a private sector rate, are fixed term, and therefore may not be so attractive to young professionals. Finally, embedded incentives into the design is an expensive business – it is challenging to make a business case for offering incentive payments which many MSEs or those working with MSEs may not be able to afford. The founder of Mipango, which works with W-MSEs for credit upskilling in Tanzania, notes that: *"It is hard to find those who understand this context. Our developer is based in Pakistan. But we are mainly funded through accelerators so far, like UNCDF's Pesa Tech Accelerator, USAID's Kijana Nahodha, a Google accelerator, and crowd funding. We've just signed a partnership with Equity Bank to reach W-MSEs."*

Digital upskilling content should be peer-led, concise, and timely.

We learn through practice and peers, and W-MSEs are no different. Through experimentation within our programs, we learned that digital content and solutions should feature relatable insights from fellow small business owners. MESH noted that women appreciated female figureheads in videos they could relate to as online content often featured Western individuals, whether male or female (Miltenberg 2024). Some examples of relatable content from our programs include case studies or quotes from local small business owners (Horvath 2023). Peer-based digital communities can also be valuable in promoting digital upskilling programs to W-MSEs, as was observed with Hoob Marketing in Brazil, which promoted upskilling content to active Facebook communities that W-MSEs frequented (Paiva 2024).

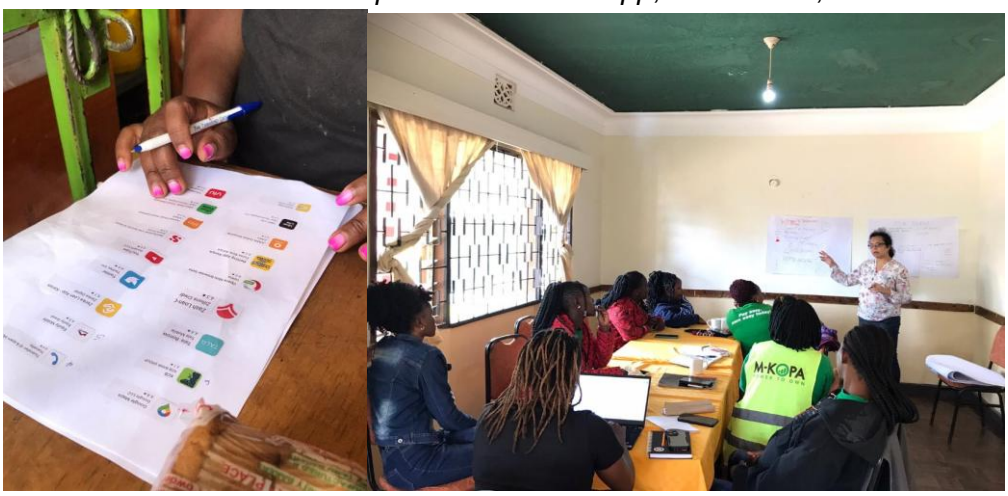
Content and solutions should also be short and to the point. Video content captures an audience's attention when it gets to the point quickly and delivers the information concisely. Our partners have seen higher engagement with shorter videos (up to three minutes long), while longer videos have much higher drop-off rates (Horvath 2023). It might be surprising that low-income women are prepared to pay for high-data-consumption videos, but these videos are short and relatable. Women prefer watching these and interacting through comments rather than a structured training course.

Finally, training should be timely. Messaging and promotion around digital upskilling content and solutions for small businesses should be tailored around events and schedules. We also learned from negative experiences—some initiatives launched promotional campaigns that coincided with political events and festive periods that hampered the momentum of the new content (Horvath 2023). On the other hand, Boost Capital aligns their financial education content to where small business customers are in their loan application journey, ensuring it's relevant and more likely to be consumed (Revell 2023).

Women upskill by experimenting on social media.

More than ten years ago, Arora and Sey (2014) noted the power of "ludic learning" or learning through play. They noted that too many "empowerment" or "development" initiatives focus on structured, formal learning, and in the digital context, this may not achieve the best outcomes as users like to experiment. Even before this, the Microsoft Research Lab in India and Sugata Mitra's "Hole in the Wall" experiment in a low-income Delhi community both found that digital users learned precisely through trial and error. At the time, women were more nervous about experimenting either because they were afraid of "breaking something" or because of fears around privacy, security, and social norms. However, as social media becomes more pervasive and more UX features are developed to make use easy, low-income communities are using social media not just for sales but also for inspiration (insights from field research with Gates Foundation). Social commerce (CGAP 2021), including social agriculture (Caribou Digital 2024), are increasingly popular sources of income generation and also offer opportunities for embedding further upskilling. Drawing on literature and case studies from India, Indonesia, and Kenya, Dean et al. (2024) illustrate how social commerce can be used for embedded finance and, therefore, opportunities for W-MSE and entrepreneur growth. Indeed, with all the interest in generative AI (GenAI), we find farmers are beginning to experiment with GenAI embedded in WhatsApp, as WhatsApp is already a known interface (Laufer 2024). While there is no clear causal evidence of the impact of skilling through social media, we do see women (and broadly low-income, low literacy communities) learning through experimentation and play (Sambasivan and Holbrook, 2018). We should explore how this natural learning occurs more systematically, to learn lessons from here.

Figure 5: In a workshop on digital skills in peri-urban Kenya, female entrepreneurs noted the main three uses of their smartphones as WhatsApp, the camera, and M-PESA.



Source: Caribou Digital (2023)

The natural upskilling through GenAI is another area we should explore. Shortlist Futures, one of the Gates grantees interviewed, suggested that GenAI could be used further for role play, so a woman could practice interviews or test scenarios where she could gain confidence without feeling she was being judged. Early evidence illustrates that GenAI has helped in a workplace environment with training and help *augment* tasks. However, one paper, albeit in Denmark, also finds that women in the same roles as men typically use GenAI less than men (Humlum and Vestergaard 2024). Another RCT with 640 Kenyan MSEs (not gender disaggregated) notes some level of prompt engineering skills are necessary to gain value out of GenAI interaction (Otis et al. 2024). Though it is early for W-MSEs and entrepreneurs, particularly in low-income contexts, to be applying GenAI, we continue to watch this space as partners begin to experiment with AI-driven initiatives.

Looking ahead

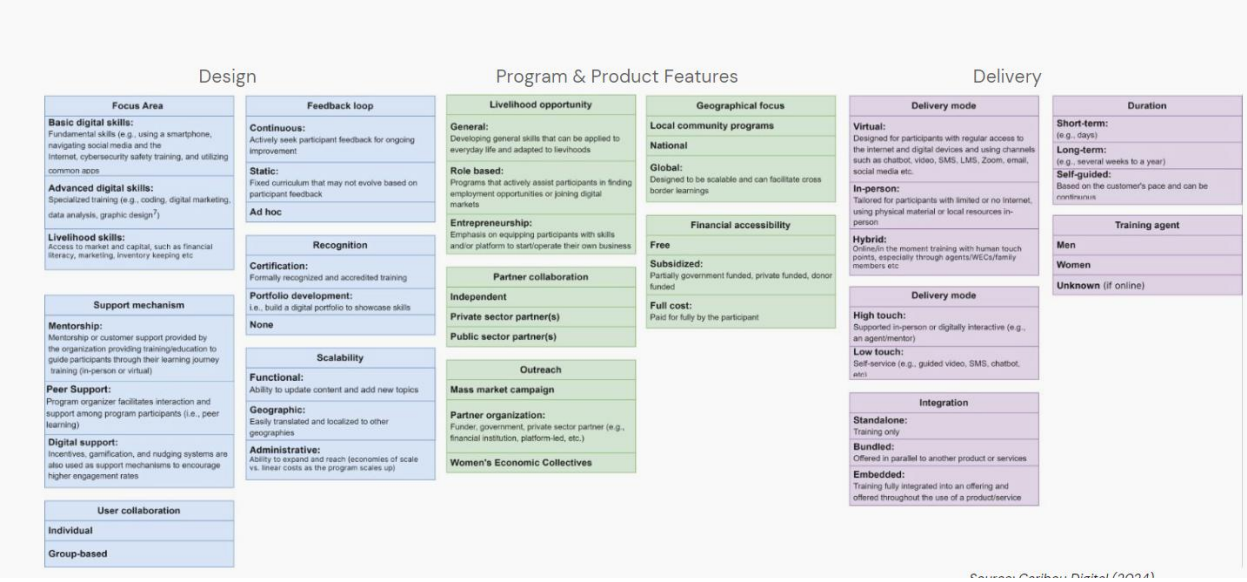
In summary, it is easy to turn to digital as the preferred option for upskilling W-MSEs and entrepreneurs. However, as literature and our experiences show, digital upskilling needs to be implemented thoughtfully, in terms of both content and delivery, to achieve positive impacts and outcomes on W-MSEs. Human touch must be a consideration alongside the tech elements; tailored one-to-one digital support, such as mentoring, offers valuable personalized guidance; upskilling content that is bundled or embedded into existing digital solutions can immediately put learning into practice; reminders and incentives can drive deeper engagement and completion, and content that is short, peer-led, and delivered just in time can increase its relevancy to W-MSEs. The explosion of GenAI is also an emerging consideration here, and while it's still early, we continue to watch this space.

We recognize that digital upskilling programs for W-MSEs may be unable to integrate all of these insights, and we are not advocating that all are required to drive positive upskilling outcomes. Instead, we are encouraging other practitioners to consider these, alongside the norms and barriers that W-MSEs experience, to identify digital upskilling approaches that can lead to enhanced business practices and contribute to women's increased income generation, livelihoods, and agency.

In support of this, we have developed a digital upskilling taxonomy where those working with W-MSEs may consider the components of upskilling (refer to Appendix B for a larger version of Figure 6).

We present a draft of this in Figure 6, though this needs to be refined for accessibility.

Figure 6: A taxonomy of digital upskilling for W-MSEs

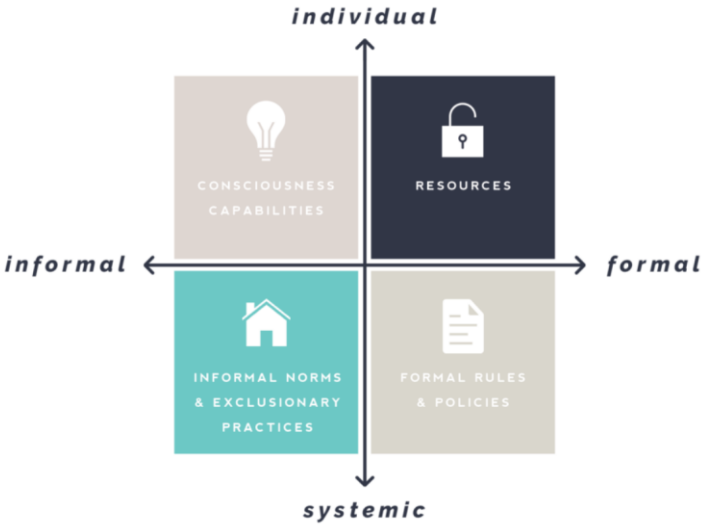


Source: Caribou Digital

Similar to UCT's acknowledgment of the broader context in their application of the DigComp Framework, we would also like to apply the Gender at Work Framework to illustrate that unconscious social norms are embedded within formal rules, laws, and norms, and must be acknowledged alongside our taxonomy (see Figure 7).[3] While any partner planning to execute a digital upskilling intervention could use the above taxonomy as a guide, they would also need to bear in mind that skilling does not exist in a vacuum and needs to be considered within the broader ecosystem that women live in. The Gender at Work framework in Figure 7 illustrates how access to resources (which includes skilling) is only one of the quadrants that contribute to women's economic empowerment through digital tools.

[3] This Gender at Work framework was also applied in our paper on women's livelihoods through mobile phones in Bailur and Masiero, 2017.

Figure 7: The Gender at Work Framework



Source: Gender at Work framework (2024)

All digital upskilling interventions need to consider the norms that women face. In addition, a further challenge for the digital upskilling of W-MSEs is that organizations working in digital upskilling for women need to consider whether women have an opportunity to *apply the skills*. As the founder of Shortlist Futures noted: *"Well let's say we train our demographic—women in Kenya—to interact with GenAI. Let's say they learn that so-and-so braid styles are in and they buy all the supplies for this to sell to customers. What if no one buys because the market takes a dip? We've done the skilling, but there is no market. We need to be responsible about that."*

Digital tools, particularly low-cost smartphones, have great potential to increase the incomes of women entrepreneurs and W-MSEs through access to markets and access to capital. This income increase could also lead to agency and livelihoods. With access to income, a woman may have more possibilities and the ability to be independent. Digital upskilling (both the medium and the message, as noted above) seems an obvious pathway to change. However, as always with digital, we need to consider the context and relevance of the skilling provided, as well as the ecosystem in which skilling is embedded. As noted by Ruha Benjamin, a Princeton University professor, and the author of "Race After Technology", we should "Move slow and empower people" rather than "Move fast and break things" by putting too much innovation in digital skilling.

Appendix A: Donor-funded initiatives referenced in this research

Initiative partner	Donor	About
Arifu	Gates Foundation; Mastercard Strive	A digital training company working with W-MSEs in East Africa.
Boost Capital	Mastercard Strive	A platform that enables small businesses to access financial services and financial literacy learning through smartphones.
Boost Technology	Mastercard Strive	A B2B commerce platform combining data analysis, behavioral science, and conversational commerce to empower W-MSEs with insights to drive digital confidence and business resilience.
Circle	Gates Foundation	An NGO in Pakistan awarded Gates Foundation funding on digital skilling to low-income women
Hoob Marketing	Mastercard Strive	A digital marketing agency specializing in impact projects, working with education partners and virtual communities to strengthen and drive the growth of small businesses in Latin America.
MESH	Gates Foundation; Mastercard Strive	A Kenya-based online community for entrepreneurs in the informal economy, offering upskilling, peer networking and role-model mentoring to young people.
Shomvob	Gates Foundation	A job-matching platform in Bangladesh, awarded Gates Foundation funding for gender intentionality in job-matching for blue and silver collar workers.
Shortlist Futures	Gates Foundation	A learning grant through Gates Foundation on “Gender and AI Livelihoods” (GAIL). GAIL will sub-contract research grants to partners in sub-Saharan Africa.
Tumbu Accelerator	Mastercard Strive	A learning and development organization in Indonesia that upskilled more than 6,000 small businesses (the majority were W-MSEs) through small, facilitated WhatsApp-based groups and mentors.

Appendix B: A taxonomy of digital upskilling for W-MSEs

Design

Focus Area
Basic digital skills: Fundamental skills (e.g., using a smartphone, navigating social media and the Internet, cybersecurity safety training, and utilizing common apps
Advanced digital skills: Specialized training (e.g., coding, digital marketing, data analysis, graphic design[7])
Livelihood skills: Access to market and capital, such as financial literacy, marketing, inventory keeping etc

Support mechanism
Mentorship: Mentorship or customer support provided by the organization providing training/education to guide participants through their learning journey training (in-person or virtual)
Peer Support: Program organizer facilitates interaction and support among program participants (i.e., peer learning)
Digital support: Incentives, gamification, and nudging systems are also used as support mechanisms to encourage higher engagement rates

User collaboration
Individual
Group-based

Feedback loop
Continuous: Actively seek participant feedback for ongoing improvement
Static: Fixed curriculum that may not evolve based on participant feedback
Ad hoc

Recognition
Certification: Formally recognized and accredited training
Portfolio development: i.e., build a digital portfolio to showcase skills
None

Scalability
Functional: Ability to update content and add new topics
Geographic: Easily translated and localized to other geographies
Administrative: Ability to expand and reach (economies of scale vs. linear costs as the program scales up)

Program & Product Features

Livelihood opportunity
General: Developing general skills that can be applied to everyday life and adapted to lievihoods
Role based: Programs that actively assist participants in finding employment opportunities or joining digital markets
Entrepreneurship: Emphasis on equipping participants with skills and/or platform to start/operate their own business

Partner collaboration
Independent
Private sector partner(s)
Public sector partner(s)

Outreach
Mass market campaign
Partner organization: Funder, government, private sector partner (e.g., financial institution, platform-led, etc.)
Women's Economic Collectives

Geographical focus
Local community programs
National
Global: Designed to be scalable and can facilitate cross border learnings

Financial accessibility
Free
Subsidized: Partially government funded, private funded, donor funded
Full cost: Paid for fully by the participant

Delivery

Delivery mode
Virtual: Designed for participants with regular access to the internet and digital devices and using channels such as chatbot, video, SMS, LMS, Zoom, email, social media etc.
In-person: Tailored for participants with limited or no Internet, using physical material or local resources in-person
Hybrid: Online/in the moment training with human touch points, especially through agents/WECs/family members etc

Delivery mode
High touch: Supported in-person or digitally interactive (e.g., an agent/mentor)
Low touch: Self-service (e.g., guided video, SMS, chatbot, etc)

Integration
Standalone: Training only
Bundled: Offered in parallel to another product or services
Embedded: Training fully integrated into an offering and offered throughout the use of a product/service

Duration
Short-term: (e.g., days)
Long-term: (e.g., several weeks to a year)
Self-guided: Based on the customer's pace and can be continuous

Training agent
Men
Women
Unknown (if online)