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Digital Access and Use Index

The Digital Access and Use Index (DAUI) is a composite metric designed to capture how well individuals in low resource settings can access and use mobile-phone and internet technologies. The DAUI seeks to expand the measurement of the digital gender gap beyond device ownership to consider quality of access, digital skills, digital agency, safety and security, and the real-life relevance of digital activities. The accompanying survey questions proposed to measure the Index have been developed following cognitive testing in India, Kenya and Nigeria. The listing below represents a sub-set of a broader bank of digital access and use questions available for use (Annex 1).

Components of Digital Access and Use

Table 1. Components of Digital Access and Use *

Dimension		Components
Access	Connectivity	Network access, quality SIM cards Electricity
	Physical access	Ownership, Sharing Phone type and condition Periodicity of access
	Affordability	Device and connectivity expenditure
Use	Digital competency	• Information and data literacy • Communication and collaboration • Digital content creation • Safety • Problem solving • Device, software operation • Digital financial skills
	Safety and security	Data protection and privacy; Fraud
	Social norms, Attitudes	Social norms and attitudes towards phone ownership, internet use, use of phones for financial transactions
	Digital agency	Decision-making; Permissions; Restrictions / constraints

*Annex 1 contains a more comprehensive listing of items associated with Digital Access and Use

Each domain in the Digital Access and Use Index captures a distinct aspect of how individuals interact with mobile and internet technologies. These domains ranging from physical access and digital skills to safety, autonomy, and use-case relevance of digital activities are designed to reflect how meaningfully they use the devices or internet. A sub-set of priority items within the domains listed in Table 1 have been used to derive the Digital Access and Use Index. By drawing from items across these domains, the Index allows for targeted insights into which barriers different populations face and where interventions may be most needed.

Minimum set of Digital Access and Use Items

Table 2. Minimum set of questions used in the digital access and use index

Physical Access Score				
Access score = (A*B) + C + D		**Questions to measure item**	**Response Options**	**Item Scoring criteria**
A. Ownership Score	101	Have you ever used a mobile phone?	1-Yes, 2-No	0 - No access
	102	Do you have your own mobile phone?	1-Yes, 2-No	1 - Sharer
	103	Is there a mobile phone that you use?	1-Yes, 2-No	2 - Owner
B. Phone Type	104	What type of mobile phone do you have?	1-Basic phone 2- Feature phone 3- Smart phone	0 - No Access
				1 - Basic Phone
				2 - Feature Phone
				3 - Smart Phone
C. All components of the phone working	For the phone, please assess the following components:			
	105	Can the mobile phone remain on without being connected to the charger?	1-Yes, 2-No	0 - No Access
	106	Screen cracked so severely content cannot be read	1-Yes, Screen Cracked 2- No, Screen Intact	1 - Some components not working
	107	Touch screen works and/or all keys work	1-Yes, 2-No	2- All components working
D. Access during morning, afternoon or whole day	108	When was the mobile phone within your reach yesterday? In the morning, in the afternoon, in the evening, or in the night?	1-Whole day 2- Morning (6am - 12pm) 3- Afternoon (12pm - 6pm) 4-Evening (6pm - 10pm) 5-Night (10pm - 6 am) 6-Not at all	0 - No Access or Not at all
				1 - Night/ Evening Only
				2 - Morning/Afternoon Only
				3 - Whole Day

Safety and Security Score

Lock on Phone (1) + Lock on Banking App (1)		Questions to measure item	Response Options	Item Scoring criteria
Have lock on phone	201	Is there a lock, pin, or passcode on the mobile phone you use?	1-Yes, 2-No 98-Don't know	1 - Yes
Have lock on Banking App	202	Is there a lock on any of the applications you use? - Banking apps	1-Yes, 2-No 3-I don't use this	1 - Yes

Digital Agency Score

Agency Score (1)		Questions to measure item	Response Options	Item Scoring criteria
Decision-making on phone use	301	Who makes decisions about who can use the phone and when they can use it?	Self/Spouse or Fiancé/Father/ Mother/ Brother/ Sister/ Son/ Daughter/Mother-in-law/Father-in-law/Other male relative/Other female relative/Friend/Respondent and Spouse/Respondent and other person/Other (Specify)	Agency Score = 1 if respondent solely makes decisions about who can use the phone and when

Digital Competency Score

Competency Score = x/15 skills reported		Questions to measure item	Response Options	Item Scoring criteria
Sent SMS or WhatsApp	401	Have you ever typed and sent a message on WhatsApp, Facebook messenger or other chat apps?	1-Yes, 2-No	1 - Yes, to either
	402	Have you ever written and sent an SMS text message?	1-Yes, 2-No	
Navigated auto prompts (IVR)	403	Which key you would press if you want to talk to a doctor? (After playing an audio sample of an IVR)	1-Completed the task 2-Did not complete the task	1 - Completed the task
Made a phone or WhatsApp call	404	Have you ever made a phone call by dialing a number?	1-Yes, 2-No	1 - Yes, to either
	405	Have you ever made a call on WhatsApp, Facebook Messenger or any other such apps?	1-Yes, 2-No	

Shared media via app	406	Have you ever shared a document, picture, or video through a message on WhatsApp, Facebook Messenger or other such apps?	1-Yes, 2-No	1 - Yes
Took a photo or video	407	Have you ever taken a photo with a mobile phone?	1-Yes, 2-No	1 - Yes, to either
	408	Have you ever taken a video with a mobile phone?	1-Yes, 2-No	
Created a social media account	409	Have you ever created an account on Facebook, Twitter, Instagram etc.?	1-Yes, 2-No	1 - Yes
Made a post or story on social media	410	Have you ever made a reel, story, or short on YouTube, Facebook, Instagram, etc.?	1-Yes, 2-No	1 - Yes
Downloaded an app	411	Have you ever downloaded an app on a mobile phone?	1-Yes, 2-No	1 - Yes
Created a hotspot	412	Have you ever created a hotspot using a mobile phone?	1-Yes, 2-No	1 - Yes
Searched the internet (Google)	413	Have you ever searched for information on the internet (e.g. Google, YouTube)?	1-Yes, 2-No	1 - Yes
Scanned a QR code	414	Have you ever used a mobile phone to scan a QR code?	1-Yes, 2-No	1 - Yes, to either
	415	Have you ever used a mobile phone to scan a QR code and buy something?	1-Yes, 2-No	
Used G Pay/Paytm (send/receive money)	416	Have you ever used Google Pay/G pay, PhonePe, Paytm or similar apps to receive money?	1-Yes, 2-No	1 - Yes, to either
	417	Have you ever used Google Pay/G pay, PhonePe, Paytm or similar apps to send money?	1-Yes, 2-No	
Used mobile banking	418	Can you access your bank account using your mobile phone?	1-Yes, 2-No	1 - Yes
Blocked a number	419	Have you ever blocked a number on a mobile phone?	1-Yes, 2-No	1 - Yes
Lock on phone	420	Is there a lock, pin, or passcode on the mobile phone you use?	1-Yes, 2-No	1 - Yes

Scoring Approach

1. **Empirical reduction**: Structural Equation Modelling (SEM) and Principal Component Analysis (PCA) were applied to the original item pool to identify latent dimensions, drop weak items (e.g., “Attitudes”, network-strength, electricity), and confirm the five-domain

structure. These methods allowed us to narrow the universe of items to the current set used for the index.

However, the data used for the empirical measure is only relevant to an extremely niche and homogenous population which might not be representative globally. The decisions to include or exclude certain items cannot be entirely based on data. Theoretical and logical considerations are required. Item weighting cannot be accomplished by a data driven approach for this Index. Methods of measurement play a significant role in the value contributed to the index. This is why we require an expert consensus.

2. **Expert consensus on weighting (Delphi method)**: Iterative survey rounds with sector specialists converged on relative weights for each retained item. This step moves beyond sample-specific statistics to a weighting scheme. *Link to working Delphi Questionnaire*[1]

Summary of scores assigned to components

Table 3. Composition and scoring of the DAU

Digital Access and Use Score - Subcomponents		Max score	%	#Q	%
Digital Competency	Digital skills	15	52%	20	67%
Physical Access	Ownership x Phone type	6	21%	4	13%
	Condition of phone	2	7%	2	7%
	Access during the day	3	10%	1	3%
Safety and Security	Lock on phone (device)	1	3%	1	3%
	Lock on banking app	1	3%	1	3%
Digital Agency	Decision making over phone use	1	3%	1	3%
Total		**29**	**100%**	**30**	**100%**

Two domains drive the Digital Access and Use Score: Digital competence and Physical Access. The Index itself is generated by splitting a continuous score into four levels: No Access (0), Low (1 - 10), Medium (11 - 20), High (21 - 29).

[1] https://docs.google.com/document/d/10YwBHXLKTqSeJ3A_7cUWzpyss8BK-VyE/

Index uses

1. Conceptualized as a continuous variable:

The DAU Index can be visualized as a continuous variable to identify trends in the digital access and use in various populations as well identify differences in various groups. Fig 1a. Shows the distribution in a tested sample population between men and women which showed how the DAU index can highlight a significant gender gap in the sample population. Fig 1b. further shows the trends by various socioeconomic factors.

Figure 1a. DAU Scores distribution in a tested sample population

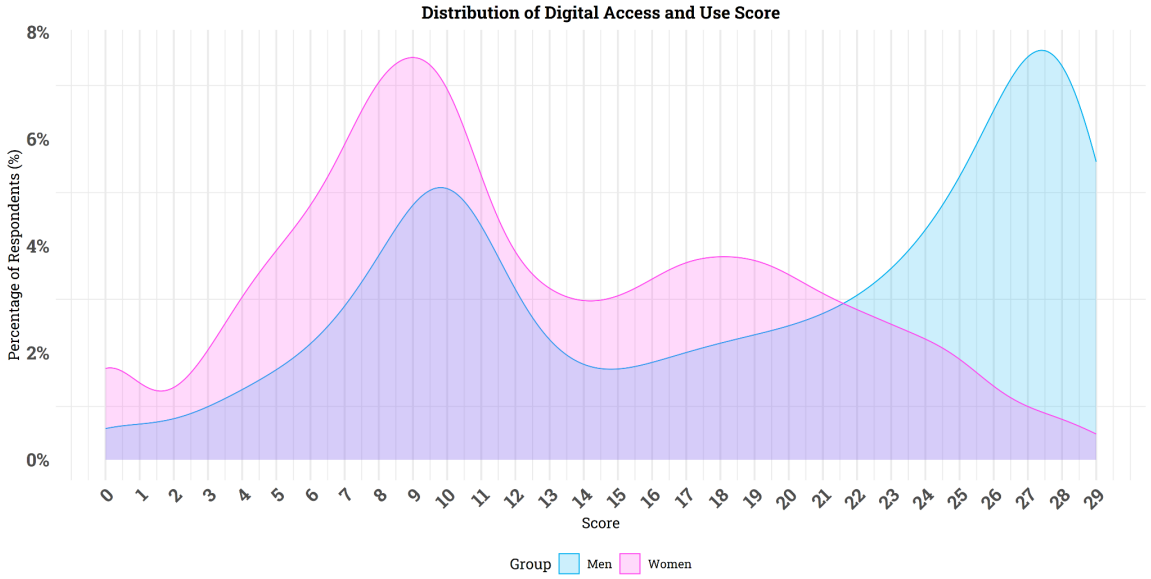
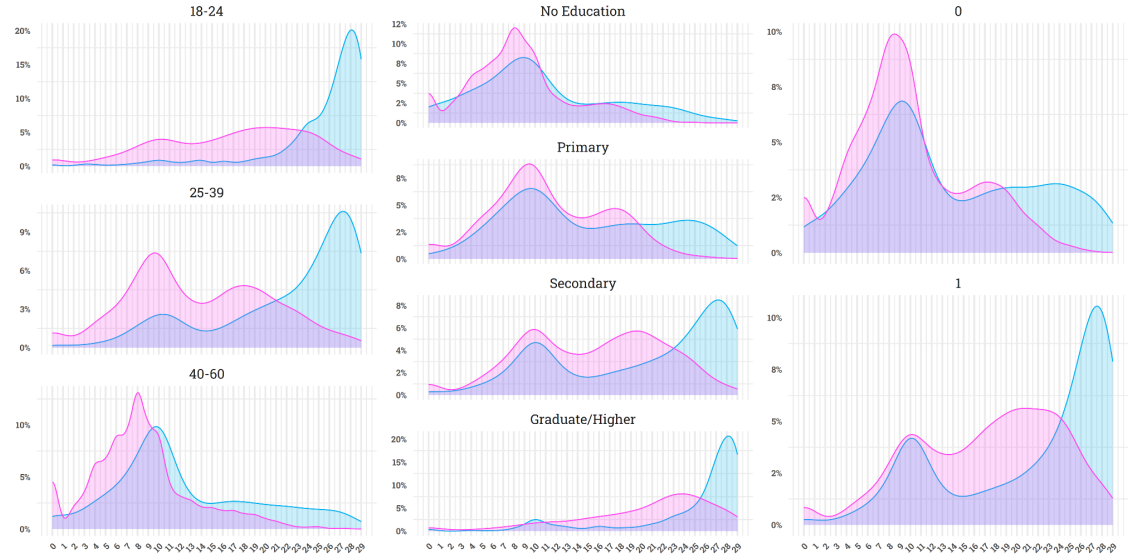


Figure 1b. DAU Scores distribution in a tested sample population



2. Break out the "Digital Access" from the "Digital Use" → helps to showcase that removing physical access barriers alone is insufficient

Further, we can disaggregate the Access components from the Use components of the index to differentially assess trends. Figures 2a and 2b show a shortened scale of the index with only three Use components. An example of programmatic significance of the index comes in fig 2b where we look at the use scores for a population with Smartphone ownership and still note a significant gender gap in use. This indicates that even in people who own smartphones, which is theoretically the highest level of digital access, a gender gap in skills persists which is not explained by the underlying differences in access.

Figure 2a. DAU Scores distribution in a tested sample population

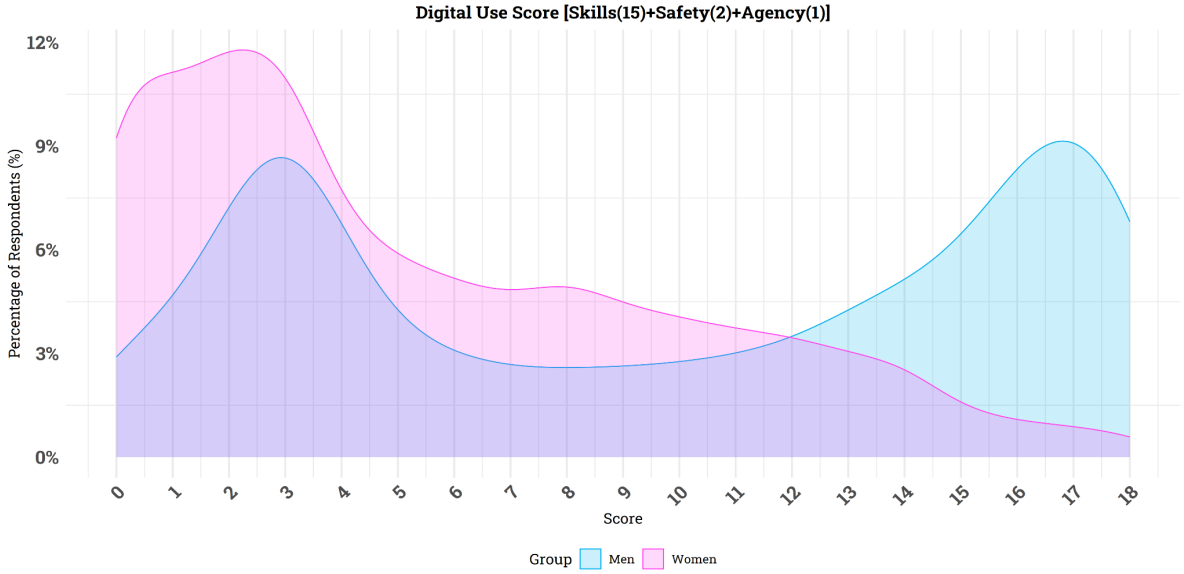
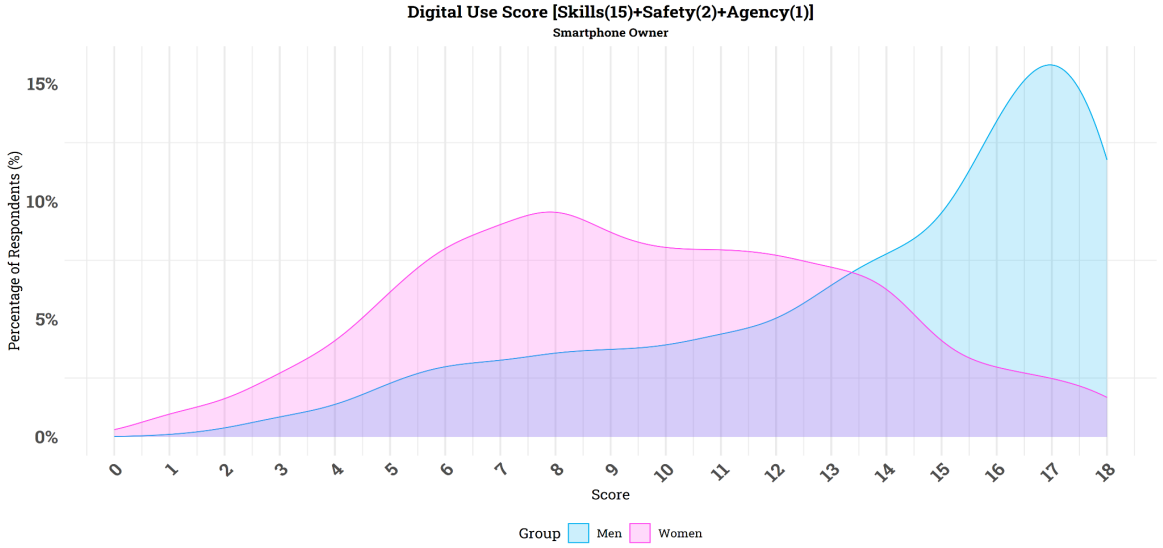


Figure 2b. DAU Scores distribution in a tested sample population



3. Monitoring, learning and evaluation → evidence generation

The DAUI provides a structured and standardized way to assess how different populations interact with digital technologies. By disaggregating data by SES factors, the index can help evaluate the effectiveness of digital inclusion interventions.

4. Comparisons over time, across geographies, and by gender

A core strength of the DAUI is its ability to make comparative assessments. The index can be used to track progress in digital access and use within a community or region over time, benchmark performance between groups, and identify pockets of digital exclusion that require focused interventions. This temporal comparability can enable policymakers and researchers to understand which populations are being left behind and tailor strategies accordingly.

5. Inform program design, resource allocation, advocacy

Insights from the DAUI can guide the development and refinement of digital programs. Programs can be designed to target populations with low competency scores despite high access levels. Resources can be allocated to the most critical barriers, whether it's affordability, agency, or digital skills. By pinpointing exactly where gaps lie, the Index aims to inform evidence-based decision-making and facilitate more equitable digital development.

Annex 1. Full listing of items and survey questions available on Digital Access and Use

Domain	Definition	Sub-domains	Items
Access	The ability of individuals or groups to access digital technology through: (1) **Physical access** to the device, (2) **Mobile networks**, and (3) the **Affordability** of these mobile devices and connectivity.	Physical Access	Device ownership Shared access Primary use of device Device characteristics: type of phone, condition Characteristics of Access: device movement, timing of access, duration of access, recency, frequency
		Connectivity	Electricity: availability, source, duration of supply Network access: type of network, strength of network SIM cards: availability, number, validity
		Affordability	Expenditure on devices: Device acquisition, cost of maintenance/ repairs Expenditure on connectivity: type of subscription, credit availability, amount spent in last 30 days, recency of last top-up, who performed last top up
Digital competence	The confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. (EU JRC)	Information and data literacy	Browsing, searching and filtering data, information and digital content Evaluating data, information and digital content Managing data, information and digital content
		Communication and collaboration	Interacting through digital technologies Sharing through digital technologies Engaging in citizenship through digital technologies Collaborating through digital technologies Managing digital identity (digital footprint)
		Digital content creation	Developing digital content Integrating and re-elaborating digital content Programming
		Safety and security	Protecting devices Protecting personal data and privacy Protecting health and well-being
		Problem solving	Solving technical problems Identifying digital competence gaps
		Devices and software operations	Physical operations of digital devices Software operations on digital devices
		Digital financial and economic skills	Online banking Use of Mobile Money
		Career related competencies	Cadre specific
Safety and security	Experiences of and behaviors related to data protection and privacy, digital violence, digital fraud, physical and mental health impact of tech, misinformation and disinformation, biases.	Digital violence	Online harassment Abuse, sexual assault Cyberstalking Image based abuse Hate speech Doxxing
		Digital fraud	Fraud (online sales, trading, employment) Financial identity scams (phishing) Financial identity scams (catfishing)
		Privacy and data protection	Identity theft Surveillance Data breaches, doxing, hacking
		Physical and mental impacts of tech use	Neck and shoulder strain, posture Sleep health Headaches Addiction (incl. online gambling) Depression, anxiety Enabling drug abuse, disordered eating, self-harm
		Misinformation/ Disinformation	False information, fabricated content, mal-information Deepfakes Bots
		Biases in AI	Data bias: sampling, historical, selection, reporting Algorithmic bias, Confirmation bias Group attribution bias User bias
Social and gender norms	The societal and cultural expectations, norms, and biases that affect engagement with digital technologies and online spaces.	Attitudes, Norms	Attitudes (What I believe is good or bad and what ought to be) towards phone ownership, internet use, social media Injunctive norms (What I believe others will approve/disapprove of me doing): reported approval of key stakeholders (mother in law, husband) towards women's phone ownership, internet use, use of phones for financial transaction Descriptive norms (What I believe others do): do most women own smartphones, use the internet, use the phone for financial transactions
Digital agency	The ability of individuals to critically understand, navigate, and influence digital environments to meet their goals. (OECD 2021)	Permission	Making calls/ texting Answering calls/ texts Watching videos Posting content Searching for information / content
		Supervision/ monitoring	Social media use Phone calls: making/ receiving Internet use Posting content
		Decision-making	Device purchase, type Data / talktime Phone use: chatapps, videos, calls
CROSS CUTTING	Barriers	Reasons for limited or no access to phones, access to smartphones, use of the internet, and other digital services	Reasons for not having a phone or a smartphone, reasons for not using the internet, using the phone for various purposes. Response options cut across access and use domains to cover issues related to connectivity, affordability, skills, safety & security, agency, attitudes, and relevance.