

Measuring Digital Skills in Low- and Middle-Income Countries

**A guide for inclusive
research and design**



Measuring Digital Skills in Low- and Middle-Income Countries

**A guide for inclusive
research and design**

Table of Contents

Acknowledgements	6
Overview	7
Introduction	7
SDG Indicator 4.4.2	7
Competency-based approaches	8
Monitoring progress	8
Adapting the Digital Skills Indicator (DSI) for mobile first populations	9
Toolkit Aims	9
Toolkit Structure	9
General principles for framing questions on digital skills measurement	13
Observation of skills	18
Recommended self-reported survey questions	19
1. Information and Data Literacy	21
<i>1.1 Browsing, searching and filtering data, information and digital content</i>	22
1.1.1 Searching for information on the internet	22
<i>1.2 Evaluating data, information and digital content</i>	23
1.2.1 Verifying the truthfulness of information found online	23
<i>1.3 Managing data, information and digital content</i>	24
1.3.1 Creating a folder on a computer, tablet, or mobile phone	24
1.3.2 Deleting a file on a computer, tablet, or mobile phone	25
2. Communication and Collaboration	26
<i>2.1 Interacting through digital technologies</i>	27
2.1.1 Sending and receiving textual messages (email, chat apps, SMS)	27
2.1.2 Sending and receiving voice messages	28
2.1.3 Sending attachments (email, chat apps)	29
2.1.4 Making calls (cellular, VOIP)	30
<i>2.2 Sharing through digital technologies</i>	31
2.2.1 Participating in social networks	31
<i>2.3 Engaging in citizenship through digital technologies</i>	32
2.3.1 Using e-Governance services	32
<i>2.4 Collaborating through digital technologies</i>	34
2.4.1 Using online conferencing and meeting tools	34
2.4.2 Using collaborative office suites (Google Docs, Google Slides, etc.)	35
<i>2.6 Managing digital identity</i>	36
2.6.1 Creating a profile online	36
3. Digital Content Creation	37
<i>3.1 Developing digital content</i>	38
3.1.1 Creating and editing text documents	38
3.1.2 Using basic formulae in a spreadsheet	38
3.1.3 Creating and editing presentations	39
3.1.4 Taking a photo or video	39
<i>3.2 Integrating and re-elaborating digital content</i>	40
3.2.1 Creating new digital content from existing content	40
<i>3.4 Programming</i>	41
3.4.1 Writing a computer program	41

Table of Contents

4. Safety	42
4.1 <i>Protecting devices</i>	43
4.1.1 Implementing security measures to protect access to devices and online accounts	43
4.1.2 Managing software application permissions on devices	44
4.2 <i>Protecting personal data and privacy</i>	45
4.2.1 Managing access to own personal data	45
4.2.2 Changing settings in own internet browser to block or limit cookies on any of the respondent devices	47
4.3 <i>Protecting health and well-being</i>	47
4.3.1 Blocking unwanted communication	48
4.3.2 Reporting negative content	49
5. Problem Solving	50
5.1 <i>Solving technical problems</i>	51
5.1.1 Finding solutions on the internet for problems on a mobile phone or computer	51
5.4 <i>Identifying digital competence gaps</i>	52
5.4.1 Using online learning tools to improve digital skills	52
6. Devices and Software Operations	53
6.1 <i>Physical operations of digital devices</i>	54
6.1.1 Connecting and installing a new device (e.g. a camera, printer etc.)	54
6.1.2 Charging a mobile phone	54
6.1.3 Turning on / off a mobile phone	55
6.1.4 Increase / decrease volume on a mobile phone	55
6.2 Software operations in digital devices	56
6.2.1 Turning on flashlight on a mobile phone	56
6.2.2 Turning on the speaker during a call on a mobile phone	56
6.2.3 Saving contacts on a mobile phone	57
6.2.4 Taking a screenshot on a mobile phone	57
6.2.5 Switching on the bluetooth on a mobile phone	58
6.2.6 Installing an app on a mobile phone	58
6.2.7 Deleting an app on a mobile phone	59
6.2.8 Connecting to a WiFi network	59
6.2.9 Creating a hotspot on a mobile phone	60
6.2.10 Turning location settings on / off on a mobile phone	60
6.2.11 Increasing / decreasing brightness on a mobile phone	61
6.2.12 Changing the language on a mobile phone	61
7. Digital Financial and Economic Skills	62
References and Annexes	63
References	64
Annex 1. Prerequisite module for observation of digital skills	65
Annex 2. List of activities covered under DSI 2.0	67
Annex 3. Observation of digital skills	70
Annex 4. Explainer on applications and the internet	74

Acknowledgements



This Toolkit was developed by a consortium of partners led by the University of Cape Town's School of Public Health, consisting of the University of Cape Town (UCT), the Johns Hopkins Bloomberg School of Public Health, York University, and 2X Digital. Authors included Amnesty LeFevre (UCT), Sara Chamberlain (2xDigital), Kerry Scott (York University), Diwakar Mohan (JHU), Osama Ummer (UCT), Arjun Khanna (UCT), Tanya Sinha (UCT) and Anjora Sarangi (UCT). The Toolkit was developed with support from the Gates Foundation.

Suggested citation: UCT. (2024, November). *Measuring digital skills in low- and middle-income countries: A guide for inclusive research and design*. University of Cape Town; Johns Hopkins Bloomberg School of Public Health; 2xDigital.

The Toolkit leverages technical inputs from partners obtained through individual consultations, online webinars hosted by the GSMA's Knowledge Hub, and two workshops conducted in New Delhi in 2023. The content represents original information and information that has been adapted through cognitive testing in India, Kenya, and Nigeria. We thank Devsol Research Consultant Private Limited for conducting the cognitive interviews for UCT in India, and Ipsos for conducting the cognitive interviews for UCT in Kenya and Nigeria.

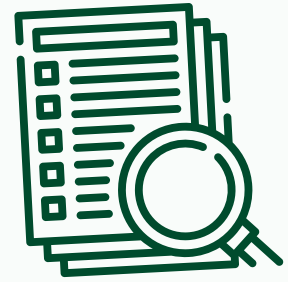
We thank the following organisations for providing access to their original surveys: BBC Media Action, European Commission, Eurostat, Global Kids Online, the GSMA, ICF Macro, International Institute of Population Sciences (IIPS), International Telecommunication Union (ITU), Kilkari Impact Evaluation Team, National Institutes for Statistics, PEW Research Center, Philippine Survey and Research Organization, Research ICT Africa, SurveyMETER, TRUSTe, UNICEF, United Nations Capital Development Fund, University of Oxford, and the World Bank.

We additionally wish to thank Dan Harder for graphic design.

Measuring Digital Skills in Low- and Middle-Income Countries: A guide for inclusive research and design © 2025 by University of Cape Town is licensed under CC BY-NC-SA 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-sa/4.0>

License: CC BY-NC-SA 4.0

Overview



Introduction

As the pace of digital transformation accelerates in the Global South, the focus on harnessing digital technologies to meet sustainable development goals is intensifying. Numerous sectors, such as agriculture, health, and economic empowerment, have already incorporated digital strategies to amplify their impact. Yet, this progress is not without its challenges. Concerns have arisen about those who are being left behind. Consequently, efforts to bridge the gender digital divide and to design digital solutions that more effectively meet the needs of women and girls in low- and middle-income countries (LMICs) have intensified. In this context, the accurate definition and measurement of digital skills that are relevant to ‘mobile-first’ populations become paramount.

SDG Indicator 4.4.2

UNESCO’s SDG Indicator 4.4.2 **measures the percentage of youth and adults who have achieved at least a basic level of proficiency in digital literacy skills** [1]. UNESCO defines digital literacy as ‘the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship’ [2].

When developing its Digital Literacy Global Framework (DLGF) [3] for SDG indicator 4.4.2, UNESCO built on the European Commission’s Digital Competence Framework for Citizens [4], which identifies five key areas of digital competence:

- Information and data literacy,
- Communication and collaboration,
- Digital content creation,
- Safety, and
- Problem-solving.

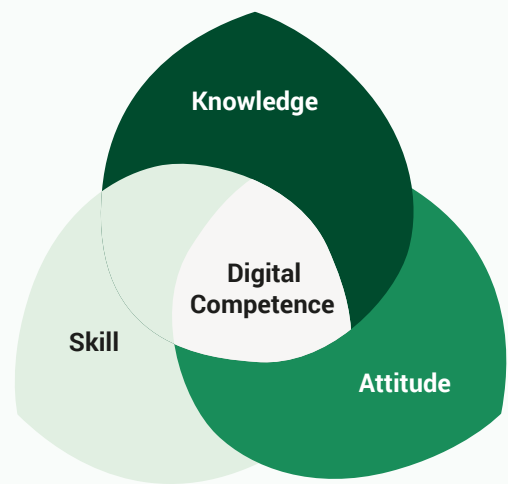
UNESCO enhanced the DigComp framework, adding 'operation of devices and software' and 'career related competencies' [3].

The terms 'digital literacy' and 'digital competence' are often used interchangeably [5]. This is not surprising because the word 'competence' has long been associated with 'literacy', which traditionally refers to the ability to read and write [6]. The European Union defines digital competence as: 'The confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society,' [7], which is similar to UNESCO's definition of digital literacy.

Competence-based approaches

Competence-based educational frameworks, such as DigComp 2.2, define learning outcomes in three areas: knowledge, attitudes, and skills. DigComp 2.2 offers the following definitions:

- **Knowledge:** The theoretical understanding and information that a person has about a particular subject or field.
- **Skills:** The practical abilities and techniques that a person has developed through training and practice.
- **Attitudes:** The values, beliefs, and dispositions that a person has towards their work and their interactions with others.



Monitoring progress

To monitor progress towards digital competence in the European Union, the European Commission introduced the **Digital Skills Indicator (DSI)** [8], which is based on the DigComp framework. Developed by the Eurostat Information Society Working Group, **DSI 2.0** is a statistical indicator designed to monitor digital competence and media literacy across EU countries. It uses variables collected by the EU Survey on ICT Use by Households and Individuals. The indicator only measures skills (not knowledge and attitudes), and focuses on measuring practice, assuming that individuals performing certain activities possess the corresponding skills. In 2019, after a systematic review of measurement tools, UNESCO concluded that DSI was the most promising approach to assessing the digital competencies within its framework, but recognised the need for further research and development to improve measurement, including of knowledge [9].

Adapting the Digital Skills Indicator for mobile first populations

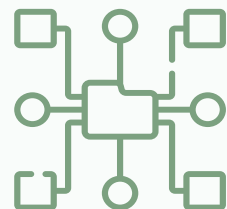
Given that the DigComp framework and DSI were primarily designed to measure computer-based skills in a European context, we have conducted cognitive testing [10] in India, Kenya, and Nigeria to modify existing survey questions and design new questions that are relevant to **mobile-first populations**, including those in low-resource settings. These questions align with the digital competence domains identified in the DigComp framework and DSI 2.0, but additionally cover the competence area of hardware and software operations in UNESCO's framework, as well as critical skills related to digital financial and economic competencies.

Toolkit aims



This Toolkit aims to support more inclusive and equitable measurement of digital skills to inform the design of digital development solutions and digital skills training programmes that better meet the needs of disadvantaged populations, and to enhance the evaluation of these efforts. This Toolkit outlines approaches for measuring digital skills at the individual level through quantitative surveys.

Toolkit structure



The digital skills questions in this Toolkit are categorised into the digital competence areas defined by the Digital Competence Framework for Citizens [4], and have been further enhanced by UNESCO [3] and the EQUALS Global Partnership [5].

DigComp2.2 operates at multiple levels, providing a structured model (Table 1). At the first level, it defines **competence areas** (e.g., '1. Information and Data Literacy'). Within each competence area, it defines **specific competences** (e.g., '1.1 Browsing, searching, and filtering data, information, and digital content'). A competence, in this context, represents a cohesive collection of knowledge, attitude, and skills relevant to a specific digital domain.

Although we acknowledge the significance of all three learning domains, we focus exclusively on skills within this Toolkit, in keeping with the European Commission's Digital Skills Indicator [8]. We recommend quantitative survey questions for each competence area, and for most specific competences in DigComp, which are drawn from global surveys and enhanced through cognitive interviews in India, Kenya, and Nigeria.

Table 1. Digital competence areas and competences measured by the Digital Skills Indicator

Competence Area	Definition	Competences	Covered in DSI	Covered in this Toolkit
1. Information and Data Literacy	To articulate information needs, to locate and retrieve digital data and content. To judge the relevance of the source and its content. To store, manage and organise digital data, information and content [4].	1.1 Browsing, searching and filtering data, information and digital content	x	x
		1.2 Evaluating data, information and digital content	x	x
		1.3 Managing data, information and digital content		x
2. Communication and Collaboration	To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity. To participate in society through public and private digital services and participatory citizenship. To manage one's digital presence, identity and reputation [4].	2.1 Interacting through digital technologies	x	x
		2.2 Sharing through digital technologies	x	x
		2.3 Engaging in citizenship through digital technologies	x	x
		2.4 Collaborating through digital technologies		x
		2.5 Netiquette		
		2.6 Managing digital identity		x
3. Digital Content Creation	To create and edit digital content. To improve and integrate information and content into an existing body of knowledge while understanding how copyright and licensing are to be applied. To know how to give understandable instructions for a computer system [4].	3.1 Developing digital content	x	x
		3.2 Integrating and re-elaborating digital content	x	x
		3.3 Copyright and licences		
		3.4 Programming	x	x

Competence Area	Definition	Competences	Covered in DSI	Covered in this Toolkit
4. Safety	To protect devices, content, personal data and privacy in digital environments. To protect physical and psychological health, and to be aware of digital technologies for social wellbeing and social inclusion. To be aware of the environmental impact of digital technologies and their use [4].	4.1 Protecting devices	x	x
		4.2 Protecting personal data and privacy	x	x
		4.3 Protecting health and well-being		x
		4.4 Protecting the environment		
5. Problem Solving	To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments. To use digital tools to innovate processes and products. To keep up-to-date with the digital evolution [4].	5.1 Solving technical problems	x	x
		5.2 Identifying needs and technological responses	x	
		5.3 Creatively using digital technologies		
		5.4 Identifying digital competence gaps		x

In keeping with UNESCO's enhancement of DigComp [3], this toolkit also provides questions for measuring 'operation of devices and software', as gaining these essential digital skills are critical to unconnected women and girls in LMICs.

Competence Area	Definition	Competencies	Covered in this Toolkit
6. Devices and software operations	To identify and use the functions and features of the hardware tools and technologies [3]	6.1 Physical operations of digital devices	x
		6.2 Software operations in digital devices	x

And finally, in recognition of the importance of participation in the digital economy, we additionally recommend measuring digital financial and economic skills, such as those identified by the European Commission’s 2016 Digital Consumer Competencies framework [11]. These survey questions are included in a separate toolkit, which was commissioned by DFS Lab and developed by a coalition of partners led by the University of Cape Town. That toolkit aims to support more inclusive measurement of the digital economy, including use of digital services and platforms by the self employed, and individuals working in micro and small to medium sized enterprises. See Section 1, ‘Integration of digital technologies in economic activities’ in the *Measuring Participation in the Digital Economy Toolkit* for recommended survey questions.

Competence Area	Definition	Covered in the <i>Measuring Participation in the Digital Economy Toolkit</i>
7. Digital Financial and Economic Skills	The competencies that consumers [and producers] need to function actively, safely and assertively in the digital marketplace [11].	This competence area includes digital financial skills, and digital skills related to trading, gig work, sharing, influencing and finding work.



General principles for framing questions on digital skills measurement

Surveys with mixed or low-literacy populations must be facilitated (rather than self administered)

In deciding how to administer a structured survey, implementers should consider the population's age, education and literacy, time available for the survey, and specific survey needs. Among high literacy populations, respondents can be asked to self-administer the survey with ability to perform selected skills being self-reported. Among populations with mixed or low literacy, surveys should be facilitated by an interviewer. The respondent can be observed to complete selected skills, or asked to report whether they have performed skills.

Measure reported practice ['have you ever'] rather than reported ability ['do you know how to...']

When phrasing questions to assess skills, there is a crucial distinction between measuring reported practice (using questions like 'Have you ever...') and reported ability (using questions like 'Do you know how to...'). Eurostat suggests using reported practice as a proxy for skill, because relying solely on reported ability risks capturing respondent self-efficacy or confidence, even if they've never actually performed the task (but feel they could do it). This variability in self-efficacy can lead to underestimation by some groups and overestimation by others. For this reason, we recommend assessing reported skill through reported practice rather than through reported ability.

Use simple and easy to understand language including contextually appropriate terms

Prioritise words that are widely used and understood. Well-known local terms for subordinate items, such as brand names, are easier for respondents to understand than global hypernyms (terms for the entire category). For example, asking about the use of 'phones, tablets, computers' is clearer to respondents than asking about the use of 'digital technology'; asking about the use of 'mPesa, Opay, or PayTM' is clearer than asking about the use of 'Mobile Money'.

Measure one construct at a time

Questions that ask about multiple constructs result in inconsistent and unclear measurement. Questions should measure just one construct at a time.

Keep sentences short and avoid unnecessary qualifiers and clauses

Questions with multiple clauses increase the cognitive burden placed on respondents and can lead to confusion. Remove non-essential clauses and qualifiers.

For interviewer-administered surveys, use the 'question-answer' format rather than 'statement-response' format.

Instead of having an interviewer read the statement 'I have [done X]' and inviting the respondent to respond 'agree' or 'disagree', have the interviewer ask 'Have you ever [done X]?' and have the respondent answer yes or no.

Use simple response options and short (three-point) Likert scales

Gradients of feeling or intensity of agreement/disagreement do not resonate in some populations. Thus, in some populations, 'strongly agree' or 'somewhat agree' are not understood as distinct categories. Three-point scales work across populations.

Add examples and explanation boxes as appropriate

When key terms must be used in a survey but are not understood in a standardised manner by all respondents, include explanation boxes that focus on examples. For instance, if the term 'internet' must be used in the survey, include an explanation that focuses on naming key brands and uses of the internet (i.e., 'Using the internet means searching on Google, Yahoo or others, looking at YouTube, TikTok, Twitter, or others, shopping on Amazon, calling on WhatsApp...') rather than explaining the concept of the internet (i.e., 'The internet is a network of networks that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of...').

Phrase each question should stand alone and avoid stem and leaf style questions

Each question should be standalone. Stem and leaf style questions, wherein a question stem appears first (i.e., 'Have you ever used a computer or phone') followed by leaves ((a) [to do X]? (b) [to do Y]? (c) [to do Z]?), place a high cognitive burden on respondents to retain the stem throughout question administration. Better quality data is achieved through integrating the stem into each leaf to create separate, standalone questions (i.e., (1) Have you ever used a computer or phone to do X? (2) Have you ever used a computer or phone to do Y? (3) Have you ever used a computer or phone to do Z?).

Reduce cognitive burden when assessing recency by asking about timing of most recent use rather than use within a certain period

Asking respondents whether they have completed an action in a preset period of time ('In the last three months have you ...?') places a high cognitive burden on the respondent. They must consider whether they have done the action, they must calculate when the time period in question occurred, and they must consider whether their action fell within that time period. We found that some respondents struggled to complete these three mental processes, and instead recalled what they were doing at the reference period time (i.e., three months ago) or recalled completing the action but were unsure if their action fell within the pre-set time period (i.e., 'I did it last week; I don't know about three months ago.') We propose assessing recency by asking the respondent whether they have 'ever [done X]' then asking 'When was the last time you [did X]?' The interviewer can then place the respondent's reply in an appropriate time category, discussed next.

Measure recency according to response categories that allow for analysis that accounts for wide range of potentially relevant time periods

When asking 'When was the last time you [did X]?', the interviewer should categorise the respondent's answer in an appropriate time category, according to response categories presented in the Table 2 below. Recognizing that different activities occur with varying frequencies, we aim to establish an 'ever practice' baseline and then assess recency without rigidly tying it to a specific time window, which may or may not align with the relevant context. Depending on the level of granularity required for your programmatic or analytic data needs, either of the two options may be appropriate for use. Throughout this toolkit we have presented the mutually exclusive time categories option (the first column in Table 2) because each response option is unambiguous and discrete. However, this response option requires interviewers to convert the types of natural language responses they will receive ('today,' 'yesterday,' 'this week,' etc.) into the specific predefined categories. Careful training of interviewers will be required to ensure that they can accurately categorise responses provided.

Table 2. Measuring recency

Question: When was the last time you [did X]?	
Response options:	
Mutually exclusive time categories	Overlapping natural language time categories
<ol style="list-style-type: none">1. Less than 24 hrs ago2. 2 - 7 days ago3. 8 - 14 days ago4. 15 - 31 days ago5. More than 1 month but less than 3 months ago6. More than 3 months ago but within the last 1 year7. More than 1 year ago	<ol style="list-style-type: none">1. Today or yesterday2. Within the last week3. Within the last two weeks4. Within the last month5. Within the last three months6. Within the last year7. More than one year ago

Avoid double negatives

Avoid questions that ask about something negative because if the respondent has not done or disagrees with the negative in the question, identifying the appropriate response option is confusing. For example, the question 'Do you have a Mobile Money account that is in your own name (i.e. not using someone else's, not a joint account)?' could generate a response of 'No' among respondents who mean 'No I do not have my own account' or 'No, I am not using someone else's account.'

Observation of skills



Where possible, consider verifying respondents' ability to perform digital skills with observations instead of measuring their reported ability. When developing a survey tool which includes observed digital skills, consider the ethical implications of measurement in your context. We recommend

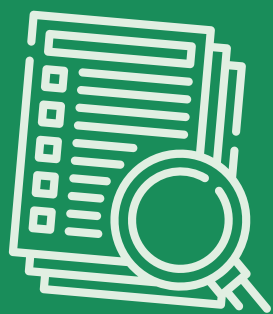
1. Allowing the respondent to use their personal mobile device;
2. Reimbursing respondents for any costs incurred, including data or talk time;
3. Consider the addition of questions which are needed to measure contextual conditions which could impact the respondent's ability to perform a task. This includes questions assessing the presence / availability of the mobile phone and its condition and fit for purpose in performing the tasks asked of the respondent, availability of a network connection, and safety for the respondent.

In this Toolkit, all listed observed skills are described to be observed only on a mobile phone

This decision is based on our 'mobile-first' approach, recognizing that most digital access is through phones not desktops, tablets, or laptops. Thus we are asking respondents to show us their phones, assessing the functionality of the phone, and – for all those with functional phones – asking them to demonstrate skills under interviewer observation.

Questions using the observed modality of measuring digital skills should administer a preliminary module measuring related conditions at the start of the survey

Questionnaires that intend to use the observed modality of measurement as part of facilitated structured surveys must include an additional module, which is to be completed with respondents before the skills questions can be administered. This module must be used to design conditions for the programming of surveys, and ensure that respondents are not asked to do tasks that they cannot perform due to device or hardware limitations. An example of this module is provided in Annex 1.



Recommended self-reported survey questions

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

In this section, we present recommended self-reported questions for assessing digital skills within the digital competence areas outlined in Section 1.3. Note that self-reported is different from self-administered – we are proposing self-reported questions that would be administered to accommodate lower-literacy respondents.

- These survey questions are suitable for interviewer-administered surveys and may require modification when using self-administered tools.
- As previously mentioned, the Digital Skills Indicator assessment gauges digital skills through contextual activities, such as searching for health information or news online. A comprehensive list of these activities for each competence area can be found in Annex 2.
- We have developed alternative questions through cognitive testing in India, Kenya and Nigeria that are not limited by specific use cases, allowing for a broader context for the identification of skill, and preventing individuals from being excluded because they have not used the skill in a specific context.
- We have adapted questions for users who use mobile devices primarily, but have retained references to computers or tablets where skills are more easily performed on these devices. The majority of questions are device agnostic.
- We have included questions for those with low language literacy (for example, voice search in addition to text search).
- Questions about recency of the task should be included where required, at the discretion of the survey designer (See section: *General Principles for digital skills measurement*).

1. Information and Data Literacy



The 'Information and Data Literacy' digital competence area encompasses skills related to **sourcing**, **evaluating**, and **managing information and content** in digital environments. It encompasses all forms of digital content and pertains to activities associated with consuming digital information.

Skills covered in this section:

Table 3: Skills under the 'Information and Data Literacy' competence area

1. Information and Digital Literacy	
1.1 Browsing, searching and filtering data, information and digital content	
1.1.1	Searching for information on the internet
1.2 Evaluating data, information and digital content	
1.2.1	Verifying the truthfulness of information found online
1.3 Managing data, information and digital content	
1.3.1	Creating a folder on a computer, tablet, or mobile phone
1.3.2	Deleting a file on a computer, tablet, or mobile phone

1.1 Browsing, searching and filtering data, information and digital content

This competence covers skills related to identifying information needs, locating this information in online spaces, and adeptly navigating through digital environments.

1.1.1 Searching for information on the internet

Code	Question	Response	Source
A	Have you ever searched for information on the internet (e.g. Google, YouTube, {other locally relevant examples})?	1. Yes >> Ask A.1 2. No 9999. Don't know/ Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from <i>Global Kids Online 2021</i> . Cognitively tested in Nigeria and Kenya.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- This question intentionally avoids specifying the method used by the user to perform the search, taking into account low-literate individuals who may prefer voice search over text-based methods. It also does not specify the purpose of the search (for example, to find news or health-related information) because this might exclude individuals who do not search for these kinds of information. Additionally, the question is device-agnostic.
- Some respondents may struggle with the term 'internet'. To address this, survey designers should provide an explainer box (Annex 4) on the 'internet' before questions that use the term.

1.2 Evaluating data, information and digital content

This competence covers activities related to analysing, interpreting, and verifying the accuracy and reliability of information or digital content found online.

1.2.1 Verifying the truthfulness of information found online

Code	Question	Response	Source
A	Have you ever checked if information you found online was true? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Cognitively tested in Nigeria and Kenya.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
B	[If the response to the question above is 1 or 2] How did you check the truthfulness of the information found on the internet? (tick all that apply) [Probe: 'Have you done it any other way?' Until exhausted.]	1. Checking the sources or finding other information on the internet (e.g. other news sites, Wikipedia etc.) 2. Following or taking part in discussion on the internet regarding the information 3. Discussing the information offline with other persons or using sources not on the internet 4. Other	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.

Key considerations

- Question 1.2.1.A only focuses on whether individuals have performed the activity, without identifying the method used by the respondent. Question 1.2.1.B enables identification of the method used by the respondent.

1.3 Managing data, information and digital content

This competence covers activities related to the storage, organisation, and management of information and content in digital environments.

1.3.1 Creating a folder on a computer, tablet, or mobile phone

Code	Question	Response	Source
A	<p>Have you ever created a folder on a computer (desktop), laptop, tablet, or mobile phone?</p> <p>[Interviewer note: Read out response options]</p>	<p>1. Yes >> Ask A.1 2. No</p> <p>9999. Don't know/Refused/I don't understand</p>	<p>Modified by UCT Metrics Team for the Digital Access and Use Project from MICS-7. Cognitively tested in Kenya and Nigeria.</p>
A.1	<p>[If the response to the question above is 1-Yes]</p> <p>Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you..</p> <p>[Interviewer note: Read out response options]</p>	<p>1. Done this on your own 2. Done this only with help/assistance</p>	

Key considerations

- This question assesses if individuals understand the basics of how the directory structure works within a digital file system, and if they can manipulate this structure on a device.

1.3.2 Deleting a file on a computer, tablet, or mobile phone

Code	Question	Response	Source
A	<p>Have you ever deleted photos, videos, documents or other files on a computer (desktop), laptop, tablet, or mobile phone?</p> <p>[Interviewer note: Read out response options]</p>	<p>1. Yes >> Ask A.1 2. No</p> <p>9999. Don't know/ Refused/I don't understand</p>	<p>Modified by UCT Metrics Team for the Digital Access and Use Project from MICS-7. Cognitively tested in Kenya and Nigeria.</p>
A.1	<p>[If the response to the question above is 1- Yes]</p> <p>Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you..</p> <p>[Interviewer note: Read out response options]</p>	<p>1. Done this on your own 2. Done this only with help/assistance</p>	

Key considerations

- This question assesses if individuals are able to manipulate files stored on a device.

2. Communication and Collaboration

The ‘Communication and Collaboration’ digital competence area encompasses skills related to using digital communication tools and platforms for interaction, communication, and collaboration with individuals and groups. It also includes skills such as creating and managing digital identities, using collaborative technologies (such as video-conferencing tools), and other interactions within digital environments. We have not included questions on competence 2.5 Netiquette (see Table 4 below), as this competence is best measured through a combination of knowledge-based and attitude-oriented questions.

Skills covered in this section:

Table 4: Skills under the ‘Communication and Collaboration’ competence area

2. Communication and Collaboration	
2.1 Interacting through digital technologies	
2.1.1	Sending and receiving text messages (email, chat apps, SMS)
2.1.2	Sending and receiving voice messages
2.1.3	Sending attachments (email, chat apps)
2.1.4	Making calls (cellular, VOIP)
2.2 Sharing through digital technologies	
2.2.1	Participating in social networks
2.3 Engaging in citizenship through digital technologies	
2.3.1	Using eGovernance services
2.4 Collaborating through digital technologies	
2.4.1	Using online conferencing and meeting tools
2.4.2	Using collaborative office suites (Google Docs etc.)
2.5 Netiquette	
No skills questions have been provided for this competence as it is best measured through a combination of knowledge-based and attitude-oriented questions.	
2.6 Managing digital identity (digital footprint)	
2.6.1	Creating a profile online

2.1 Interacting through digital technologies

This competence covers the use of communication technologies to interact with others.

2.1.1 Sending and receiving textual messages (email, chat apps, SMS)

Code	Question	Response	Source
Email			
A	Have you ever sent, replied to, or forwarded an email? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Chat Applications			
B	Have you ever written and sent a message on {WhatsApp and other locally relevant chat applications}? [Interviewer note: Read out response options]	1. Yes >> Ask B.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Needs testing.
B.1	[If the response to the question above is 1- Yes] Have you {#Q.B_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
SMS			
C	Have you ever written and sent a {local term for SMS / text message}? [Interviewer note: Read out response options]	1. Yes >> Ask C.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>Global Kids Online 2021</i> . Cognitively tested in Kenya and Nigeria.
C.1	[If the response to the question above is 1- Yes] Have you {#Q.C_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

Key considerations

- These questions focus on assessing whether individuals have sent and received textual messages, regardless of the application used, because it was observed during cognitive testing that many respondents did not distinguish between sending textual messages via SMS, and chat applications such as WhatsApp.
- However, practitioners may need researchers to explore this distinction further if they aim to identify which digital communication channel is more prevalent among the target population.

2.1.2 Sending and receiving voice messages

Code	Question	Response	Source
A	Have you ever recorded your voice and sent it as a message? Have you... [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Cognitively tested in India, Kenya, and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Individuals may use various applications (such as WhatsApp, Facebook Messenger, or Telegram) to send voice messages, therefore this question should not be restricted to a single application, unless practitioners are trying to decide which application to use for a specific digital programme.

2.1.3 Sending attachments (email, chat apps)

Code	Question	Response	Source
A	Have you ever added a text file, picture, or video to an email or message? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>MICS-7</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Individuals may use various applications (such as WhatsApp, Facebook Messenger, or Telegram) to send attachments, therefore this question should not be restricted to a single application, unless practitioners are trying to decide which application to use for a specific digital programme.
- The question also covers a range of file types (the attachment), as identifying the type of file is not required for a basic assessment of this skill.
- During cognitive testing in low-resource contexts, it was observed that many respondents did not perceive media files included in a chat application message as 'attachments.' Consequently, the term 'attachment' has intentionally been omitted.

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

2.1.4 Making calls (cellular, VOIP)

Code	Question	Response	Source
Cellular			
A	Have you ever made a phone call by dialling a number? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>Global Kids Online 2021</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
VOIP			
B	Have you ever made a call on { <i>WhatsApp, Facebook Messenger, Facetime, Skype, or other locally relevant examples</i> } or any other app like this? [Interviewer note: Read out response options] [Both voice and video calls qualify for this question]	1. Yes >> Ask B.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Cognitively tested in Kenya and Nigeria.
B.1	[If the response to the question above is 1- Yes] Have you {#Q.B_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Individuals may use various applications (e.g. WhatsApp, Facebook Messenger, Telegram) to make a VOIP call, therefore this question should not be restricted to a single application, unless practitioners are trying to decide which application to use for a specific digital programme.
- During cognitive testing in low-resource contexts, it was found that many respondents did not differentiate between making a call over a cellular network and making a call using a VOIP application. Survey designers may therefore choose to cover both cellular calls and VOIP calls in one question, based on the requirements of the research activity.

2.2 Sharing through digital technologies

This competence covers the use of communication platforms and technologies to share data, information, and digital content with others.

2.2.1 Participating in social networks

Code	Question	Response	Source
A	Have you ever created an account on { <i>Facebook, Twitter, Instagram, TikTok, or other locally relevant social media platforms</i> } or any other social media app like this? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
B	Have you ever posted text, photos or videos on { <i>Facebook, Twitter, Instagram, TikTok, or other locally relevant social media platforms</i> } or any other social media app like this? [Interviewer note: Read out response options]	1. Yes >> Ask B.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
B.1	[If the response to the question above is 1- Yes] Have you {#Q.B_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Individuals may use various social media platforms (e.g. Facebook, Instagram, TikTok), therefore this question should not be restricted to a single platform, unless practitioners are trying to decide which platform to use for a specific digital programme.

2.3 Engaging in citizenship through digital technologies

This competence covers the use of communication platforms and technologies to engage in citizenship through interaction with the government or public authorities.

2.3.1 Using eGovernance services

Code	Question	Response	Source
Accessing personal information			
A	Have you ever used a mobile phone or computer to find your own <i>{birth/marriage certificates, IDs, tax returns, licences or other locally relevant examples}</i> or other information like this from a government website? [Interviewer note: Read out response options] [Interviewer note: If 'done', confirm if it is done online]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you <i>{#Q.A_insert_activity text #}</i> on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Accessing information from public authorities			
B	Have you ever used a mobile phone or computer to get information about government services and programmes such as <i>{social benefits and other relevant examples}</i> from a government website? [Interviewer note: Read out response options] [Interviewer note: If 'yes', probe to confirm that the activity was done online]	1. Yes >> Ask B.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
B.1	[If the response to the question above is 1- Yes] Have you <i>{#Q.B_insert_activity text #}</i> on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Code	Question	Response	Source
Downloading official forms			
C	Have you ever downloaded/printed any official forms from a government website or app? [Interviewer note: Read out response options] [Interviewer note: If 'yes', probe to confirm that the activity was done online]	1. Yes >> Ask C.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
C.1	[If the response to the question above is 1- Yes] Have you {#Q.C_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Making an appointment			
D	Have you ever made any appointment via a website or app for a government service (e.g. appointment at a government hospital)? [Interviewer note: Read out response options] [Interviewer note: If 'done', confirm if it is done online]	1. Yes >> Ask D.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
D.1	[If the response to the question above is 1- Yes] Have you {#Q.D_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Submitting information to the government			
E	Have you ever submitted your information to any government website or app (e.g. submitting your tax declaration, applying for a government program, making a complaint {or other locally relevant examples})? [Interviewer note: Read out response options] [Interviewer note: If 'yes', confirm if it is done online]	1. Yes >> Ask E.1 2. No 9999. Don't know/Refused/I don't understand	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
E.1	[If the response to the question above is 1- Yes] Have you {#Q.E_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

Key considerations

- The specific websites, applications, or methods used to perform these actions vary by context and country. Researchers should aim to include contextually relevant examples, where possible, to increase respondent understanding of the questions.

2.4 Collaborating through digital technologies

This competence covers the use of digital tools and technologies for collaborative purposes.

2.4.1 Using online conferencing and meeting tools

Code	Question	Response	Source
Online conference tools			
A	Have you ever used { <i>Google Meet, Zoom, WhatsApp group call, Skype or other locally relevant examples</i> } or others like this to talk to several people at the same time? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Conference calls			
B	Have you ever used a mobile phone to call several people at the same time (that is, a group call//conference call)? [Interviewer note: Read out response options] [Interviewer note: This refers to telephone calls, not WhatsApp, Google Meet, or other types of calling]	1. Yes >> Ask B.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Needs testing.
B.1	[If the response to the question above is 1- Yes] Have you {#Q.B_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Researchers should include contextually relevant examples, where required, to increase respondent understanding of the question. Measurement of this competence has intentionally been separated into two questions, in consideration of individuals in low-resource contexts who may not have access to smartphones or internet connectivity.

2.4.2 Using collaborative office suites (Google Docs, Google Slides, etc.)

Code	Question	Response	Source
A	Have you ever worked with several people online using { <i>Google Docs, Google Slides, Google Sheets, Dropbox, Microsoft365 or other locally relevant examples</i> } or others like this? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- The question is agnostic of the specific platforms and methods used for collaborative work online. Researchers should include contextually relevant examples, where required, to increase respondent understanding of the question.

2.6 Managing digital identity

This competence covers the creation, management, and protection of individuals' digital identities. This section of the Toolkit covers 'Creating a profile online'. Protection of digital identities is covered in Section 4 about Safety.

2.6.1 Creating a profile online

Code	Question	Response	Source
A	Have you ever created a profile online i.e. added your photo and described yourself on { <i>Facebook, Instagram, TikTok or other locally relevant social media platforms</i> } etc? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- While examples provided in the question above are all social media platforms, this ability is also applicable to other types of online profiles (e.g. LinkedIn, academic portals). Researchers should include contextually relevant examples, where required, to increase respondent understanding of the question.

3. Digital Content Creation



The 'Digital Content Creation' competence area encompasses skills related to the creation and integration of digital content. This refers to digital content of all kinds, and is not limited to content of a particular format or type. We have not included questions on competence 3.3 *Copyright and Licences*, as this competence is best measured through a combination of knowledge-based and attitude-oriented questions.

Skills covered in this section:

Table 5: Skills covered under the 'Digital Content Creation' competence area.

3. Digital Content Creation	
3.1 Developing digital content	
3.1.1	Creating and editing text documents
3.1.2	Using basic formulae in a spreadsheet
3.1.3	Creating and editing presentations
3.1.4	Creating / taking a photo or video
3.2 Integrating and re-elaborating digital content	
3.2.1	Creating new digital content from existing content
3.3 Copyright and licences	
	No skills questions have been provided for this competence as it is best measured through a combination of knowledge-based and attitude-oriented questions.
3.4 Programming	
3.4.1	Writing a computer program

3.1 Developing digital content

This competence covers the creation and editing of multiple types of digital content.

3.1.1 Creating and editing text documents

Code	Question	Response	Source
A	Have you ever created or edited a { <i>Microsoft Word document or Google Doc or other locally relevant examples of word processing applications</i> }? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- The question is agnostic of the specific applications and methods used online. Researchers should include contextually relevant examples, where required, to increase respondent understanding of the question.

3.1.2 Using basic formulae in a spreadsheet

Code	Question	Response	Source
A	Have you ever used any formula on a spreadsheet, for example on { <i>Excel or other locally relevant spreadsheet software</i> }, on a mobile phone or computer? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>MICS-7</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you used any formula on a spreadsheet on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- The question is agnostic of the specific applications used. Researchers should include contextually relevant examples, where required, to increase respondent understanding of the question.

3.1.3 Creating and editing presentations

Code	Question	Response	Source
A	Have you ever created a presentation in { <i>Microsoft PowerPoint or other locally relevant presentation software</i> } with text, images, audio or video? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>DigCompSAT</i> . Cognitively tested in Kenya and Nigeria
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- The question is agnostic of the specific applications used. Researchers should include contextually relevant examples, where required, to increase respondent understanding of the question.

3.1.4 Taking a photo or video

Code	Question	Response	Source
A	Have you ever created / taken a photo or video with a mobile phone or tablet? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>DigCompSAT</i> . Cognitively tested in Kenya and Nigeria
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- This question covers both taking a photo and a video, due to the similarity of the process. Researchers may choose to measure these activities separately, based on the requirements of a digital programme.

3.2 Integrating and re-elaborating digital content

This competence involves the ability to modify, integrate, and combine various types of digital content to produce a new output.

3.2.1 Creating new digital content from existing content

Code	Question	Response	Source
A	Have you ever combined different types of music, videos, photos or text to create something new on a mobile phone or computer (e.g. adding music to a video for TikTok or Instagram)? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>DigCompSAT</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- While the examples used in the question above are from social media, this competence is applicable to other activities (e.g. the creation of posters, or infographics). Researchers may provide contextually relevant examples to increase understanding of the question, or contextualise the question based on the requirements of the digital programme.

3.4 Programming

This competence covers the creation and development of computer code, scripts, and other kinds of programmes.

3.4.1 Writing a computer program

Code	Question	Response	Source
A	Have you ever written a computer program using a programming language, for example coding for data analysis or creating a webpage? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>MICS-7</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- This question is included as it contributes to the measurement of SDG 4.4.1. However, digital programmes could gain more insights by tailoring this question to their unique needs. For instance, they could ask about a specific programming language, or a particular task or operation within a defined context.

4. Safety



The ‘Safety’ competence area is primarily concerned with safeguarding individuals, communities, and the environment from potential risks associated with digital technology use. Of the four skill areas listed in Table 6 below, we’ve prioritised skills that protect individual devices, personal data, privacy, and overall health and well-being from harmful online experiences.

Safety measures can vary based on the context. For instance, the process of setting up a password for an online account differs from the steps involved in establishing a PIN lock on a mobile device. It’s important to note that we’ve excluded questions related to competence 4.4, ‘Protecting the Environment’. This is because this competence is more effectively assessed through a combination of knowledge-based and attitude-oriented questions.

Skills covered in this section:

Table 6: Skills covered under the ‘Safety’ competence area

4. Safety	
4.1 Protecting devices	
4.1.1	Implementing security measures to protect access to devices and online accounts
4.1.2	Managing permissions for software application on devices
4.2 Protecting personal data and privacy	
4.2.1	Managing access to personal data
4.2.2	Blocking or limiting cookies
4.3 Protecting health and well-being	
4.3.1	Blocking unwanted communication
4.3.2	Reporting negative content
4.4 Protecting the environment	
	No skills questions have been provided for this competence as it is best measured through a combination of knowledge-based and attitude-oriented questions.

4.1 Protecting devices

This competence covers skills related to the protection of devices and digital content, such as the use of security measures like passwords to prevent unauthorised access to devices or digital accounts.

4.1.1 Implementing security measures to protect access to devices and online accounts

Code	Question	Response	Source
Changing password on mobile phone			
A	Have you ever changed a password or lock (e.g. PIN, finger print, face recognition) on your phone, computer (desktop or laptop), or tablet? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>MICS-7</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Application lock on a mobile phone			
B	Have you ever added a lock to an app on your phone, such as {insert relevant local example, for instance: adding a lock or password to Whatsapp?} [Interviewer note: Read out response options]	1. Yes >> Ask B.1 2. No 9999. Don't know/Refused/I don't understand	Developed by the UCT Metrics Team for the Digital Access and Use Project. Needs testing.
B.1	[If the response to the question above is 1- Yes] Have you {#Q.B_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

Code	Question	Response	Source
Changing password on online account			
C	Have you ever changed a password on an online account (e.g. Facebook, Instagram or Email password)? [Interviewer note: Read out response options]	1. Yes >> Ask C.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>MICS-7</i> . Needs testing.
C.1	[If the response to the question above is 1- Yes] Have you {#Q.C_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- These questions focus on the ability to implement security measures such as passwords or other locks for mobile devices, specific applications, and online accounts.

4.1.2 Managing permissions for software application on devices

Code	Question	Response	Source
Software application permissions			
A	Have you ever changed app permissions on a mobile phone (e.g. which app can access your camera, contacts, etc.)? [Interviewer note: Read out response options] [Note: Use application explainer if required (Annex 4).	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>GSMA Consumer Survey 2022</i> . Needs testing
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- The ability to manage individual application permissions is crucial for protecting devices and sensitive personal information, such as photos and contacts. This ability is also required to use many digital applications, which may be key to specific digital programmes.

4.2 Protecting personal data and privacy

This competence covers skills related to protecting and managing personal data and privacy in digital environments, using privacy tools and settings available in operating systems and online platforms. This Toolkit does not provide questions for assessing knowledge areas including citizens' awareness of their rights under privacy and data protection legislation in their countries, or understanding of cookies etc. It also does not provide questions for assessing individuals' attitudes towards privacy and data protection.

4.2.1 Managing access to personal data

Code	Question	Response	Source
Security of website			
A	Have you ever checked whether a website is safe and secure (e.g. checking for 'https' sites, or certificate)? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>DigCompSAT</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Restricting access to geographical location			
B	Have you ever been asked to share your location by a website?	1. Yes 2. No	Developed by the UCT Metrics Team for the Digital Access and Use Project. Needs testing.
C	Have you ever stopped a website from finding out your location? [Interviewer note: Read out response options]	1. Yes >> Ask C.1 2. No 9999. Don't know/Refused/I don't understand	
C.1	[If the response to the question above is 1- Yes] Have you {#Q.C_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

Code	Question	Response	Source
Restricting access to social networking pages			
D	Have you ever changed settings / controlled who can see your posts/messages on Facebook, Instagram, TikTok, WhatsApp etc.? [Interviewer note: Read out response options]	1. Yes >> Ask D.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>Global Kids Online 2021</i> . Cognitively tested in Kenya and Nigeria.
D.1	[If the response to the question above is 1- Yes] Have you {#Q.D_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
Use of personal data for advertising			
D	Sometimes when you open a website, it asks you to accept or deny 'cookies,' which are digital files for tracking and sharing your information. Has this ever happened to you? [Interviewer note: If respondent replies 'yes', clarify that they are reporting having been asked about 'digital cookies' on websites.]	1. Yes 2. No 98. Don't know	Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i> . Needs testing.
E	[If yes to above] Have you ever accepted / refused website 'cookies,' meaning refused to allow the tracking of personal information? [Interviewer note: Read out response options]	1. Yes >> Ask E.1 2. No 9999. Don't know/Refused/I don't understand	
E.1	[If the response to the question above is 1- Yes] Have you {#Q.E_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- These questions cover a number of competences, all of which are required to protect personal data and information. Researchers may choose to adapt these questions based on the requirement of a specific digital programme.

4.2.2 Changing settings in internet browsers to block or limit cookies

Code	Question	Response	Source
A	<p>Have you changed the settings in your internet browser to block or limit cookies on any of your devices?</p> <p>[Interviewer note: Read out response options] [Interviewer note: If respondent says they have done this (options 1 or 2) confirm that it is not a false positive and that they mean web/online cookies and not anything else]</p>	<p>1. Yes >> Ask A.1 2. No</p> <p>9999. Don't know/Refused/I don't understand</p>	<p>Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i>. Needs testing</p>
A.1	<p>[If the response to the question above is 1- Yes]</p> <p>Have you {#Q.A_insert_activity text #} on your own or only with help/assistance?</p> <p>[Interviewer note: Read out response options]</p>	<p>1. Done this on your own 2. Done this only with help/assistance</p>	

Key considerations

- This question, while only focused on the skill of interacting with settings around cookies, should ideally be paired or prefaced with a question measuring the knowledge of cookies. Cognitive interviewing showed that respondents who are unfamiliar with the concept of cookies are likely to find the skill question confusing and may thus generate false positives.

4.3 Protecting health and well-being

This competence encompasses the ability to mitigate health risks and threats to both physical and psychological well-being while using digital technologies. It extends to the protection of oneself and others from potential hazards in digital environments, such as cyberbullying. Although the DSI 2.0 question set does not address this specifically, this Toolkit provides questions to assess skills related to blocking unwanted communication, and identifying online messages targeting specific groups or individuals, and reporting negative content.

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

4.3.1 Blocking unwanted communication

Code	Question	Response	Source
A	Have you ever blocked a number on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	
B	Have you ever blocked someone on Whatsapp, Facebook, Instagram, Twitter, TikTok or other social media platforms? [Interviewer note: Read out response options]	1. Yes >> Ask B.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
B.1	[If the response to the question above is 1- Yes] Have you {#Q.B_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- These questions focus on blocking unwanted communication and interaction in two scenarios: blocking phone calls, and blocking users on online platforms.
- Different questions are provided because the process used is distinct in each scenario.
- By simply possessing a working mobile number and online accounts, individuals risk receiving unwanted communication. Being able to manage unwanted communication is therefore a critical skill.

4.3.2 Reporting negative content

Code	Question	Response	Source
A	<p>Have you ever seen messages, videos, or images online that you consider to be hostile or degrading towards groups or individuals (e.g hate speech)?</p> <p>[Interviewer note: Read out response options]</p>	<p>Yes</p> <p>No</p>	<p>Modified by the UCT Metrics Team for the Digital Access and Use Project from the <i>EU survey on ICT use in households and by individuals</i>. Needs testing.</p>
B	<p>Have you ever reported abusive messages, videos, or images online that you consider to be hostile or degrading towards groups or individuals (e.g hate speech)? Have you...</p> <p>[Interviewer note: Read out response options]</p> <p>[Interviewer note: If yes, ask them if they had assistance If no, ask them if they have ever seen any such thing]</p>	<p>1. Yes >> Ask B.1</p> <p>2. No</p> <p>9999. Don't know/ Refused/I don't understand</p>	
B.1	<p>[If the response to the question above is 1- Yes]</p> <p>Have you {#Q.B_insert_activity text #} on your own or only with help/assistance?</p> <p>[Interviewer note: Read out response options]</p>	<p>1. Done this on your own</p> <p>2. Done this only with help/assistance</p>	
C	<p>Who did you report it to? (Select all that apply)</p>	<p>1. Online (e.g., clicked on a 'report abuse' button, contacted an internet advisor or Internet Service Provider (ISP))</p> <p>2. Police, law enforcement</p> <p>3. Family member</p> <p>4. Friends</p> <p>5. Community leader</p> <p>6. Religious leader</p> <p>7. Other (specify)_____</p>	

Key considerations

- In order to measure the ability to report online content, these questions first establish whether the respondent has been exposed to content that should be reported. This enables researchers to distinguish between respondents who have never encountered harmful content, and those who have been exposed to such content, but not reported it.
- Question 4.3.2.C has been included to help identify the mechanism used for reporting. This approach is recommended due to the ambiguity around what it means to 'report content.'

5. Problem Solving



The ‘Problem Solving’ competence area encompasses skills related to the use of technology to address needs and solve problems, in both digital and non-digital environments [4]. Additionally, it includes any skills involving the innovative or creative use of digital technologies, and those related to the self-led development of digital skill and competence. This section of the Toolkit does not include questions on 5.2 *Identifying needs and technological responses*. DigComp identifies these as including digital financial skills, which this Toolkit addresses in Section 7 *Digital Financial and Economic Skills*. This section also does not include questions on 5.3 *Creatively using digital technology*, as these competences (as defined in the DigComp framework) are challenging to measure in population-level surveys.

Skills covered in this section:

Table 7: Skills covered under the ‘Problem solving’ competence area.

5. Problem Solving	
5.1 Solving technical problems	
5.1.1	Finding solutions on the internet for technical problems
5.2 Identifying needs and technological responses	
No questions here, as this competence is covered in Section 7 of this Toolkit	
5.3 Creatively using digital technology	
No questions, as these competences are challenging to measure in population-level surveys	
5.4 Identifying digital competence gaps	
5.4.1	Using online learning tools to improve digital skills

5.1 Solving technical problems

This competence relates to the troubleshooting and solving of problems related to the use of digital technologies .

5.1.1 Finding solutions on the internet for technical problems

Code	Question	Response	Source
A	<p>Have you ever had technical difficulties with your mobile phone or computer like working slowly, not charging, faulty buttons, etc.?</p> <p>[Interviewer note: Read out response options]</p>	<p>1. Yes 2. No</p> <p>9999. Don't know/Refused/I don't understand</p>	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
B	<p>[If yes to the above question] What did you do to try to solve the problem?</p> <p>[Select all that apply.]</p> <p>[DO NOT READ OUT OPTIONS]</p>	<p>1. Tried out different methods/buttons by myself 2. Searched on Google/YouTube/the internet to what to do 3. Asked a male family member 4. Asked a female family member 5. Asked a male friend or male person outside the family for help 6. Asked a female friend or female person outside the family for help 7. Went to a mobile shop or market to ask for help 8. I stopped using the phone / got a new phone 98. Others (specify).... 99. None of the above</p>	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.

Key considerations

- These questions first establish whether the respondent has faced technical difficulties. This enables researchers to distinguish between respondents who have never experienced technical problems, and those who have, but have not been able to find solutions.
- While the digital competence reference model defines this competence as finding solutions online, we have provided questions that include alternative sources of solutions, in recognition of common practices observed in low-resource contexts.

5.4 Identifying digital competence gaps

This competence encompasses the ability to discern whether one's digital skills require enhancement or updating. It involves seeking opportunities for personal growth and staying abreast of the latest digital technologies.

5.4.1 Using online learning tools to improve digital skills

Code	Question	Response	Source
A	Have you ever used online learning tools to improve your digital skills (e.g. blogs, video tutorial, online course)? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from <i>DigCompSAT</i> . Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Given the abundance of educational resources online, this question is particularly relevant in determining the respondent's ability to use digital technologies to learn digital skills. While this question is limited to *digital skills*, researchers may choose to extend it to learning other skills based on the requirements of specific digital programmes.

6. Devices and Software Operations



The 'Devices and Software Operations' competence area encompasses skills related to using hardware and software on digital devices. It includes the skills that are required to navigate the interfaces of hardware and software installed on digital devices, which are a prerequisite for using digital tools and platforms. This competence area is not included in the reference model provided by the Digital Competence Framework for Citizens. It has been sourced from the Digital Literacy Global Framework, as proposed by the UNESCO Institute of Statistics.

Skills covered in this section:

Table 8: Skills covered under the 'Devices and Software Operations' competence area.

6. Devices and Software Operations	
6.1 Physical operations of digital devices	
6.1.1	Connecting and installing a new device (e.g. a camera, printer etc.)
6.1.2	Charging a mobile phone
6.1.3	Turning on/off a mobile phone
6.1.4	Increase / decrease volume on a mobile phone
6.2 Software operations on digital devices	
6.2.1	Turning on/off the flashlight on a mobile phone
6.2.2	Turning the speaker on a mobile phone on during a call
6.2.3	Saving contacts on a mobile phone
6.2.4	Taking a screenshot on a mobile phone
6.2.5	Switching on bluetooth on a mobile phone
6.2.6	Installing an app on a mobile phone
6.2.7	Deleting an app on a mobile phone
6.2.8	Connecting to a WiFi network
6.2.9	Creating a hotspot on a mobile phone
6.2.10	Turning location settings on / off on a mobile phone
6.2.11	Increasing / decreasing brightness on a mobile phone
6.2.12	Changing the language on a mobile phone

6.1 Physical operations of digital devices

This competence covers skills related to interacting with the hardware of digital devices, such as the physical connection, replacement, and configuration of parts and devices.

6.1.1 Connecting and installing a new device (e.g. a camera, printer etc.)

Code	Question	Response	Source
A	Have you ever connected and installed a modem, camera, printer or other new device, to a mobile or computer? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Modified by UCT Metrics Team for the Digital Access and Use Project from MICS-7. Cognitively tested in Kenya and Nigeria.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- This question focuses on the ability to interface between digital devices and peripherals, which is a key hardware-related skill to extend the functionality of a device.

6.1.2 Charging a mobile phone

Code	Question	Response	Source
A	Have you ever charged the battery of a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- While this question may be too basic for surveys in high income countries or among high income populations in LMICs, it is particularly relevant for users of basic mobile phones in low-income, low-literacy contexts who often depend on assistance to manage their digital device.

6.1.3 Turning on / off a mobile phone

Code	Question	Response	Source
A	Have you ever turned a mobile phone on or off? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- While this question may be too basic for surveys in high income countries or among high income populations in LMICs, it is particularly relevant for users of basic mobile phones in low-income, low-literacy contexts who often depend on assistance to manage their digital device.

6.1.4 Increase / decrease volume on a mobile phone

Code	Question	Response	Source
A	Have you ever increased / decreased volume on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- While this question may be too basic for surveys in high income countries or among high income populations in LMICs, it is particularly relevant for users of basic mobile phones in low-income, low-literacy contexts who often depend on assistance to manage their digital device.

6.2 Software operations on digital devices

This competence covers skills related to interacting with the software interfaces of digital devices and operating systems.

6.2.1 Turning on the flashlight on a mobile phone

Code	Question	Response	Source
A	Have you ever turned on the flashlight on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Responses to this question may be influenced by the specific functionality of the respondent's mobile device.

6.2.2 Turning the speaker on a mobile phone on during a call

Code	Question	Response	Source
A	Have you ever { <i>turned the speaker on / used speakerphone / other local term for using the speaker function</i> } during a call on a mobile phone? Have you.. [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- This question accompanies an earlier question that measures whether individuals can make a phone call by dialling a number. It focuses on a more advanced skill which requires additional interaction with the user interface.

6.2.3 Saving contacts on a mobile phone

Code	Question	Response	Source
A	Have you ever saved a contact on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- During cognitive testing, individuals observed in low-literate contexts often lacked the ability to save and modify contacts on a mobile phone. This meant that many individuals who were dependent on using mobile contacts for making phone calls were unable to modify or add contacts themselves.

6.2.4 Taking a screenshot on a mobile phone

Code	Question	Response	Source
A	Have you ever taken a screenshot on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

6.2.5 Switching on / off bluetooth on a mobile phone

Code	Question	Response	Source
A	Have you ever switched on / off bluetooth on a mobile phone? Have you.. [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

6.2.6 Installing an app on a mobile phone

Code	Question	Response	Source
A	Have you ever installed an app on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- The ability to install applications on a mobile phone is a basic requirement for the customisation and use of mobile devices to meet individual needs, and for digital programmes that require individuals to use specific applications.

6.2.7 Deleting an app on a mobile phone

Code	Question	Response	Source
A	Have you ever deleted / uninstalled an app on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- While many individuals are able to install applications and download files onto their phones, some are unable to delete files, and therefore struggle with a lack of available storage space on their devices. This can be a significant problem for digital development programmes that require users to regularly capture data.

6.2.8 Connecting to a WiFi network

Code	Question	Response	Source
A	Have you ever connected to a WiFi network from a mobile phone (this includes hotspots from someone else's phone)? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- Given the nature of WiFi network connections, which typically require a one-time setup, individuals may rely on a local WiFi network that was initially set up with the help of another person. This question aims to assess their ability to independently connect to new networks.

RECOMMENDED SELF-REPORTED SURVEY QUESTIONS

6.2.9 Creating a hotspot on a mobile phone

Code	Question	Response	Source
A	Have you ever created a hotspot using a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- In many low-income settings, individuals who do not have mobile data or access to household WiFi networks often rely on shared connections from other mobile phones. This question is designed to assess whether individuals are able to share their own network connections with others.

6.2.10 Turning location settings on / off on a mobile phone

Code	Question	Response	Source
A	Have you ever turned location services (GPS) on or off on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- While this question is specifically about location services, it also serves to determine whether individuals can interact with the notification shade and quick toggle menu on their mobile devices. It is crucial to note that the procedure for enabling and disabling location services differs between Android devices and iPhones, with the latter necessitating users to navigate through the settings menu.

6.2.11 Increasing / decreasing brightness on a mobile phone

Code	Question	Response	Source
A	Have you ever increased / decreased the screen brightness on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? Have you.. [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- This question identifies whether individuals are able to interact with sliders available in the notification shade and quick toggle menu on their devices.

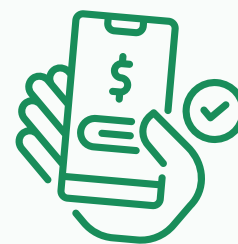
6.2.12 Changing the language on a mobile phone

Code	Question	Response	Source
A	Have you ever changed the language on a mobile phone? [Interviewer note: Read out response options]	1. Yes >> Ask A.1 2. No 9999. Don't know/Refused/I don't understand	Developed by UCT Metrics Team for Digital Access and Use Project. Needs testing.
A.1	[If the response to the question above is 1- Yes] Have you {#Q.A_insert_activity text #} on your own or only with help/assistance? [Interviewer note: Read out response options]	1. Done this on your own 2. Done this only with help/assistance	

Key considerations

- In many markets, mobile devices are sold with English as the default language option, despite low levels of English language literacy among populations. The ability to change the operating system language is thus of great importance in these contexts.

7. Digital Financial and Economic Skills

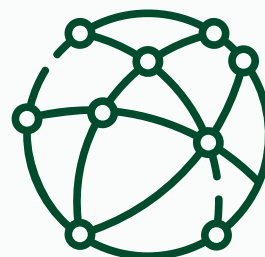


As noted in the Overview section above, we additionally recommend measuring digital financial and economic skills, such as those identified by the European Commission's 2016 Digital Consumer Competencies framework [11]. These survey questions are included in a separate toolkit, which was commissioned by DFS Lab and developed by a coalition of partners led by the University of Cape Town. That toolkit aims to support more inclusive measurement of the digital economy, including use of digital services and platforms by the self employed, and individuals working in micro and small to medium sized enterprises. See Section 1, 'Integration of digital technologies in economic activities' in the *Measuring Participation in the Digital Economy Toolkit* for recommended survey questions.



References and Annexes

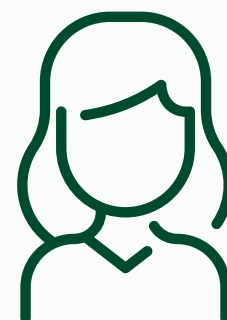
References



1. UNESCO Institute for Statistics. UNESCO Institute for Statistics. 2021 [cited 2024 Jun 3]. Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills. Available from: <https://uis.unesco.org/en/glossary-term/percentage-youthadults-who-have-achieved-least-minimum-level-proficiency-digital>
2. UNESCO. UNESCO. 2024 [cited 2024 Jun 3]. Literacy: what you need to know. Available from: <https://www.unesco.org/en/literacy/need-know>
3. Law N, Woo D, de la Torre J, Wong G. A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 [Internet]. Montreal, Canada: UNESCO Institute for Statistics; 2018. Report No.: UIS/2018/ICT/IP51. Available from: <https://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf>
4. Vuorikari R, Kluzer S, Punie Y. DigComp 2.2: The Digital Competence Framework for Citizens [Internet]. Luxembourg: European Commission. Joint Research Centre.; Report No.: JRC128415. Available from: <https://publications.jrc.ec.europa.eu/repository/handle/JRC128415>
5. EQUALS Global Partnership. Towards a Gender Transformative Approach [Internet]. International Telecommunications Union; 2024. Available from: https://www.equalshintech.org/_files/ugd/04bfff_3e55294c2d6d4174a9243006822c4c5b.pdf
6. Ferrari A. DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe [Internet]. Luxembourg: European Commission. Joint Research Centre.; 2013. Report No.: JRC83167. Available from: <https://dx.doi.org/10.2788/52966>
7. Ferrari A. Digital Competence in practice: An analysis of frameworks [Internet]. Luxembourg: European Commission. Joint Research Centre.; 2012. Report No.: JRC68116. Available from: <https://publications.jrc.ec.europa.eu/repository/handle/JRC68116>
8. Vuorikari R, Jerzak N, Karpinski Z, Pokropek A, Tudek J. Measuring Digital Skills across the EU: Digital Skills Indicator 2.0 [Internet]. Luxembourg: European Commission. Joint Research Centre.; 2022 Sep. Report No.: JRC130341. Available from: <https://publications.jrc.ec.europa.eu/repository/handle/JRC130341>
9. Laanpere M. Recommendations on Assessment Tools for Monitoring Digital Literacy within UNESCO's Digital Literacy Global Framework [Internet]. Montreal: UNESCO Institute for Statistics; 2019. Report No.: Information Paper No. 56. Available from: <https://uis.unesco.org/sites/default/files/documents/ip56-recommendations-assessment-tools-digital-literacy-2019-en.pdf>
10. Scott K, Ummer O, LeFevre AE. The devil is in the detail: reflections on the value and application of cognitive interviewing to strengthen quantitative surveys in global health. *Health Policy Plan.* 2021 Jul 1;36(6):982–95.
11. Brecko B, Ferrari A. The Digital Competence Framework for Consumers [Internet]. Luxembourg: European Commission. Joint Research Centre.; 2016. Report No.: JRC103155. Available from: <https://publications.jrc.ec.europa.eu/repository/handle/JRC103155>

Annex 1.

Prerequisite module for observation of digital skills



Questionnaires that intend to use the *observed* modality of measurement as part of facilitated structured surveys must include an additional module, which is to be completed with respondents before the skills questions can be administered. This module must be used to design conditions for the programming of surveys, and ensure that respondents are not asked to do tasks that they cannot perform due to device or hardware limitations.

Sample module: Prerequisite module for observation of digital skills

As part of the activities for the recruitment of respondents, respondents should be requested to bring their mobile phone (either their personal phone, or the mobile phone that they mostly use) with them to the interview.

Data collected from this module should be used to determine what observed skills tasks respondents can be asked to perform, based on the type of phone they have and the availability of a functional phone at the time of the interview.

Code	Question	Response Options	Notes
Q1	Do you have a mobile phone with you today?	1. Yes 2. No	If no, the respondent cannot be administered observed skills questions. If (2) >> Skip to end of section
Q2	Can I observe your phone?	1. Yes 2. No	If no, the respondent cannot be administered observed skills questions. If (2) >> Skip to end of section
The following question (Q3) is not asked of the respondent. The information is instead recorded by the interviewer based on their observation of the mobile phone.			
Q3	OBSERVE the phone for the following:		[Do not ask the respondent. To be recorded by the interviewer.]

REFERENCES AND ANNEXES

Code	Question	Response Options	Notes
a)	Type of phone	1. Basic phone 2. Feature phone 3. Smartphone	
b)	Phone switches and stays on for 3 minutes?	1. Yes 2. No	If (2) >> Skip to end of section
c)	Screen cracked so severely content cannot be read	1. No 2. Yes	If (2) >> Skip to end of section
d)	Touch screen / all keys work	1. Yes 2. No	If (2) >> Skip to end of section
e)	How many network bars are shown on the phone?	1. Full 2. More than half, but less than full 3. Half 4. Less than half, but more than none 5. None	
Q4	May I use your phone to place a missed call?	1. Yes 2. No	If (1) >> Q4a If (2) >> Q5
Q4a	Can the phone currently make a phone call? [Interviewer note: After taking permission from the respondent, place a missed call to {provided toll free number}]	1. Yes 2. No	
Q5	May I use your phone to open a website?	1. Yes 2. No	If (1) >> Q5a If (2) >> Skip Q5a
Q5a	Can the phone currently access the internet? [Interviewer note: After taking permission from the respondent, use the browser to open example.com]	1. Yes 2. No	

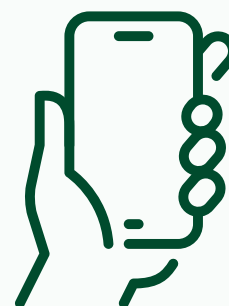
Source: Modified from Kilkari Impact Evaluation

Key considerations

- Findings from Kenya suggest that asking respondents about how much credit they currently have on their mobile phone was considered intrusive and uncomfortable.
- Additionally, many students and young people in Kenya often use 'reverse calling'. This means that they typically have no credit or pack on their phone. The call they make is charged to the receiver and not the caller.

Annex 2.

List of activities covered under DSI 2.0



1. Information and Digital Literacy
1.1 Browsing, searching and filtering data, information and digital content
1.1.1 Finding information about goods and services
1.1.2 Seeking health-related information
1.1.3 Reading online news sites, newspapers, or news magazines
1.2 Evaluating data, information and digital content
1.2.1. Activities related to fact-checking online information and its sources
1.3 Managing data, information and digital content
No activities included under DSI 2.0
2. Communication and Collaboration
2.1 Interacting through digital technologies
2.1.1 Sending / receiving emails
2.1.2 Telephoning / video calls over the internet
2.1.3 Instant messaging
2.2 Sharing through digital technologies
2.2.1 Participating in social networks
2.3 Engaging in citizenship through digital technologies
2.3.1 Expressing opinions on civic or political issues on websites or on social media
2.3.2 Taking part in online consultations or voting to define civic or political issues
2.4 Collaborating through digital technologies
No activities included under DSI 2.0
2.5 Netiquette
No activities included under DSI 2.0

REFERENCES AND ANNEXES

2.6 Managing digital identity

No activities included under DSI 2.0

3. Digital Content Creation

3.1 Developing digital content

3.1.1 Using word processing software

3.1.2 Editing photos, videos, or audio files

3.1.3 Copying or moving files (such as documents, data, images, video) between folders, devices (via e-mail, instant messaging, USB, cable) or on the cloud

3.1.4 Using spreadsheet software

3.2 Integrating and re-elaborating digital content

3.2.1 Creating files (such as documents, image, videos) incorporating several elements such as text, picture, table, chart, animation or sound

3.2.2 Using advanced features of spreadsheet software (functions, formulas, macros and other developer functions) to organise, analyse, structure or modify data

3.3 Copyright and licences

No activities included under DSI 2.0

3.4 Programming

3.4.1 Writing code in a programming language

4. Safety

4.1 Protecting devices

4.1.1 Managing access to own personal data by checking that the website where the respondent provided personal data was secure

4.2 Protecting personal data and privacy

4.2.1 Managing access to own personal data by reading privacy statements before providing personal data

4.2.2 Managing access to own personal data by restricting or refusing access to own geographical location

4.2.3 Managing access to own personal data by limiting access to profile or content on social networking sites or shared online storage

4.2.4 Managing access to own personal data by refusing allowing use of personal data for advertising purposes

4.2.5 Changing settings in own internet browser to prevent or limit cookies on any of the respondent devices

4.3 Protecting health and well-being

No activities included under DSI 2.0

4.4 Protecting the environment

No activities included under DSI 2.0

5. Problem solving

5.1 Solving technical problems

5.1.1 Downloading or installing software apps

5.2 Identifying needs and technological responses

5.2.1 Changing settings of software, app, or device

5.2.2 Online purchases (in the last 12 month)

5.2.3 Selling online

5.2.4 Used online learning resources

5.2.5 Internet Banking

5.2.6 Looking for a job or sending a job application

5.3 Creatively using digital technologies

No activities included under DSI 2.0

5.4 Identifying digital competence gaps

No activities included under DSI 2.0

Annex 3.

Observation of digital skills



1. Information and Digital Literacy

1.1 Browsing, searching and filtering data, information and digital content

Can you please show me how you would find pictures of a Kangaroo {or other animal} from the internet?

Can you please show me how you would find the website for {the Ministry of Health of Kenya / other contextually relevant use case}

1.2 Evaluating data, information and digital content

No observed questions have been recommended for this competence due to the complexity of measuring this skill in an observed format.

1.3 Managing data, information and digital content

Can you please show me how you would create a folder on your mobile phone?

Can you please show me how you would delete a folder on your mobile phone?

[Note: Ask the respondent to delete the folder that they created in the previous question.]

2. Communication and Collaboration

2.1 Interacting through digital technologies

Can you please show me how you would send an email?

[Note: Ask the respondent to demonstrate how they would send an email, but not to actually hit send]

Can you please show me how you would write and send a message on {WhatsApp and other locally relevant chat applications}?

[Note: Ask the respondent to demonstrate how they would send a message, but not to actually hit send]

Can you please show me how you would write and send a {local term for SMS / text message}?

[Note: Ask the respondent to demonstrate how they would send a message, but not to actually hit send]

Can you please show me how you would record your voice and send it as a message?

[Note: Ask the respondent to demonstrate how they would send a message, but not actually send one]

Can you please show me how you would add a text file, picture, or video to an email or message?

[Note: Ask the respondent to demonstrate how they would attach a file to a message, but not actually hit send]

Can you please show me how you would make a phone call by calling this number? [Provide toll free government helpline number]

Can you please show me how you would make a call on WhatsApp, Facebook Messenger, Facetime, Skype {use locally relevant examples} or any other app like this?

[Note: Ask the respondent to demonstrate how they would make a call, but not actually place a call. Voice and video calls are both acceptable for completion of this task]

2.2 Sharing through digital technologies

No observed questions have been recommended for this competence due to concerns around maintaining the privacy of respondents and potential exposure of interviewers to unwanted content.

2.3 Engaging in citizenship through digital technologies

Please show me how you would find information about {provide local examples of a government service or programme e.g. train timings}.

2.4 Collaborating through digital technologies

No observed questions have been recommended for this competence due to the complexity of measuring these skills in an observed format, and concerns around involving a third-party who has not consented to participate in the research.

2.5 Netiquette

This competence is more effectively assessed through a combination of knowledge-based and attitude-oriented questions, and is therefore excluded from this Toolkit on measuring digital skills.

2.6 Managing digital identity

No observed questions have been recommended for this competence due to concerns around maintaining the privacy of respondents and third-parties, and potential exposure of interviewers to unwanted content.

3. Digital Content Creation

3.1 Developing digital content

Can you please show me how you would create and add text to an MS Word document or Google Doc {provide locally relevant examples}?

Can you please show me how you would take a photo or video from your mobile phone?

REFERENCES AND ANNEXES

3.2 Integrating and re-elaborating digital content

No observed questions have been recommended for this competence due to the complexity of measuring these skills in an observed format, and concerns around maintaining respondent privacy.

3.3 Copyright and licences

This competence is more effectively assessed through a combination of knowledge-based and attitude-oriented questions, and is therefore excluded from this Toolkit on measuring digital skills.

3.4 Programming

No observed questions have been recommended for this competence due to the complexity of measuring this skill in an observed format.

4. Safety

4.1 Protecting devices

Can you please show me how you would change permissions for any app on your phone?

4.2 Protecting personal data and privacy

Can you please go to 'google.com' on your mobile phone, and show me how you check if the website is safe and secure?

[Note: This task is considered complete if the respondent: (i) highlights that they would check for 'https' in the URL, OR (ii) highlights the 'connection is secure' or 'certificate is valid' indicators.]

4.3 Protecting health and well-being

No observed questions have been recommended for this competence due to the complexity of measuring these skills in an observed format, maintaining respondent privacy, and concerns around involving a third-party who has not consented to participate in the research.

4.4 Protecting the environment

This competence is more effectively assessed through a combination of knowledge-based and attitude-oriented questions, and is therefore excluded from this Toolkit on measuring digital skills.

5. Problem solving

5.1 Solving technical problems

No observed questions have been recommended for this competence due to the complexity of measuring these skills in an observed format.

5.2 Identifying needs and technological responses

This competence has not been covered in this toolkit.

5.3 Creatively using digital technologies

This competence has not been covered in this toolkit.

5.4 Identifying digital competence gaps

No observed questions have been recommended for this competence due to the complexity of measuring these skills in an observed format.

6. Devices and Software Operations

6.1 Physical operations of digital devices

Can you please show me how you would charge the battery on your mobile phone?

[Note: The respondent does not need to actually plug in a cable, but simply show where the charging port is and say what they would do]

Can you please show me how you would check how much charge is remaining on your mobile phone?

[Note: The respondent has completed the task if they show the interviewer the battery indicator on their phone.]

Can you please show me how you would increase / decrease volume on a mobile phone?

[Note: This task is considered complete if the respondent uses the physical volume buttons on their phone.]

6.2 Software operations in digital devices

Can you please show me how you would turn your mobile phone off and on?

[Note: Respondent does not actually need to turn the mobile phone off, but simply demonstrate how they would do it]

Can you please show me how you would turn the speakerphone on during a call on your mobile phone?

{We have grouped skill by competence area, but ideally some skills benefit from being placed in a logical temporal sequence, e.g. calling a number, putting it on speakerphone, and saving a contact.}

Can you please show me how you would save a contact on your mobile phone?

Can you please show me how you would take a screenshot on your mobile phone?

Can you please show me how you would turn bluetooth on or off on your mobile phone?

Can you please show me how you would connect to {this WiFi network} from your mobile phone?

[Note: Respondents do not need to actually connect to a network. The task is complete if they can select a network to connect to. If no WiFi networks are available, respondents should use the hotspot on their mobile phone.]

Can you please show me how you would switch on a hotspot on your mobile phone?

Can you please show me how you would turn location services (GPS) on or off on your mobile phone?

Annex 4.

Explainer on applications and the Internet



This annex provides a cognitively tested read-out that can be used to explain the concepts of applications and the internet to respondents, provided below:

[Read out to respondent]

Just for your information, someone would be using the Internet when they are doing any of the following:

- Searching something on Google, YouTube etc.
(add locally relevant examples)
- Using Instagram, Facebook, TikTok, Twitter etc.
(add locally relevant examples)
- Sending messages or videos on WhatsApp, Telegram, Facebook Messenger, Gmail, etc.
(add locally relevant examples)
- Browsing or buying something on Amazon, Flipkart etc.
(add locally relevant examples)
- Sending money through Google Pay, AirtelMoney etc.
(add locally relevant examples)

We also want to tell you that Google, YouTube, Facebook, WhatsApp etc. that we were just talking about are called 'apps'.



Measuring Digital Skills in Low- and Middle- Income Countries

A guide for inclusive research and design