

1. Framework Title

Digital Literacy Global Framework (DLGF)

2. Initials

DLGF

3. Document(s) in which the framework is presented (if there are previous versions, etc.)

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<http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf>

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6. Organizations or authors responsible for developing the framework, context (if applicable)

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7. Scope: regional (indicate region) or international

In order to ensure that the proposed global framework is relevant to countries at different levels of development [...]

As DigComp is a framework developed to serve the needs of countries in Europe which are economically developed, it is important that the final proposed framework covers countries at all levels of development.

8. Synthesis

The DigComp 2.0 competence framework addresses contexts in European countries, which are typically high-income and technologically-developed. To cater for different country needs on a global scale, the proposed framework has added competences, such as CA0, Devices and software operations, and CA6, Career-related competences, as well as competence 5.5, Computational thinking.

The proposed framework and pathway mapping methodology can serve as a foundation for thematic Indicator 4.4.2 and the development of digital literacy frameworks, curricula and assessments across different countries and regions.

9. Purpose(s) of the framework

Paragraphs that present the objectives of the framework presented not necessarily in a logical sequence.

The aim of this project is to propose a definition and a global competence framework for digital literacy skills to underpin the development of Indicator 4.4.2 **(Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills)**. The framework would serve as a guide to monitor, assess and further develop digital literacy across countries at all stages

of development. The associated indicators should also serve different national contexts and be developed through cross-national collaborations.

The objective of the Digital Literacy Global Framework (DLGF) project is to develop a methodology that can serve as the foundation for Sustainable Development Goal (SDG) thematic Indicator 4.4.2: “Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills”.

The proposed DLGF is intended to serve for monitoring, assessment and further development of digital literacy, taking into consideration different levels of development. Hence, the resulting framework needs to be operationalisable to serve this purpose.

To provide meaningful guidelines for the provision of training, monitoring and assessment of digital literacy associated with employment, decent jobs and entrepreneurship in disparate contextual settings, we were inspired by the examples for employment and learning found in the DigComp 2.1 framework, which are grounded in specific contexts.

The DLGF is intended to serve as a framework of reference for different stakeholders, and the specific use differs according to the purpose. Some examples include:

- To create educational programs for a target population, for example to meet the needs of developing digital literacy programs for the implementation of a national digital strategy.
- For further research and development in order to improve the digital literacy of a target population/sector
- As a reference tool to compare against existing digital literacy frameworks/curricula. You can read about the mapping of selected digital literacy frameworks onto the extended DigComp framework in the draft DLGF report. You can read about a specific example of a curriculum being mapped to DigComp [here](#).
- As a reference tool to develop a digital literacy implementation plan. You can read about specific implementation examples of a digital literacy framework in the DigComp Gallery of Implementation within European Union member states.

10.Focus of the framework: citizens, workers, teachers, students,

managers, parents, organizations, etc.

The DLGF is intended to serve as a framework of reference for different stakeholders

Thematic indicator 4.4.2 is the “percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills.”

Sustainable Development Goal 4 (SDG 4) represents the international education agenda for the period 2015- 2030. Target 4.4, which is one of its ten targets, focuses on “relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship” among youth and adults. In the absence of many indicators that can compare similar and relevant job-related skills across countries at different levels of development, the monitoring framework for target 4.4 focuses on ICT and digital literacy skills.

11. Methodology for the elaboration of the framework

To achieve this objective, we have built on the European Commission’s Digital Competence Framework for Citizens (DigComp 2.0) as the initial framework and conducted four empirical studies to develop the proposed framework:

1. a synthesis of existing regional, national and sub-national frameworks to identify competences relevant for the global context, and in particular, analysing the extent to which existing, well-developed and all-encompassing frameworks would be relevant (i) for all countries, whether economically rich or poor, and (ii) over time (3.1 Mapping of cross-national and selected national ICT and digital literacy frameworks).

We conducted a systematic search for digital literacy frameworks in the targeted regions and countries using country names in combination with search terms, including digital, literacy, competences, skills, ICT, computer and information. A key limitation to the search results is our searches being constrained to information in the English language. Nonetheless, we were able to find information about specific digital literacy frameworks being

adopted in 47 countries (see Appendix 1).

We have selected six of the national frameworks (Costa Rica, India, Kenya, Philippines, Chile and British Columbia (Canada)) that are most clearly written with regard to the competency areas, as well as the three enterprise frameworks to map against the DigComp 2.0 framework.

We found a total of three different enterprise frameworks adopted by the 43 countries that use them, in decreasing order of popularity:

- a. International Computer Drivers Licence (ICDL)¹—adopted in 31 countries;
- b. Certiport Internet and Computing Core Certification (IC³)²—adopted in 13 countries; and
- c. Microsoft Digital Literacy Standard Curriculum³—adopted in 11 countries.

In conducting the mapping, we have adopted a low-inference approach to reduce the researcher's subjective judgement.[...] (Se desejar conhecer detalhes da metodologia para o mapeamento, ela está disponível no artigo.)

In the mapping process, we have identified two areas of digital literacy competences that may not most appropriately capture the contexts and concerns reflected in the frameworks if the mapping were to be confined only to those competence areas and competences in the DigComp framework: 1. Devices and software operations (CA0); 2. Career-related competences (CA6).

2. an analysis of digital literacy competences demonstrated in information and communications technology (ICT) use in major socio-economic sectors, with a focus on developing countries (4.1 Methodology for searching and selecting examples).

We used search engines to identify examples through news and media reports in the six sectors in low- and middle-income countries. Two kinds of systematic searches were carried out:

- a. Google searches for mainstream media and government websites in the English language; and

- b. YouTube searches for videos in any language.

Often, initial results were followed by a snowball process to search for further information from associated sources such as App store pages and company websites.

3. an in-depth consultation to seek expert views on the appropriateness and use of a global framework;

The first stage consisted of an in-depth consultation with digital literacy experts to validate the draft DLGF (see Appendix 11), which was an extension of DigComp 2.0 based on the two mapping exercises reported earlier.

During the in-depth consultation, experts were invited to review the draft executive summary of the DLGF (see Appendix 16), followed by an online interview (see Appendix 17) to seek their feedback on the relevance of digital literacy in their local contexts and the suitability of the proposed DLGF.

Of the 97 invited participants, 15 experts completed the consultation, representing a coverage of at least two countries from each six regions: Africa, Asia, the European Union, high-income nations outside of the European Union, Latin America, and the Middle East and North Africa (information about these 15 experts can be found in Appendix 18.) (6.1 In-depth consultation methodology).

4. an online consultation to seek experts' feedback on the proposed framework. We have made particular efforts to include examples and expert views from countries in the following regions: Asia, the European Union (EU), high-income.

The second consultation stage was conducted as an online survey to solicit input from a larger number of stakeholders from different countries. For the online consultation, respondents were asked to review a short video presentation (<https://www.youtube.com/watch?v=2OG4teOvtDA>) on the

proposed DLGF before completing a 22-item survey (see Appendix 19) on the competence areas and competences in the proposed DLGF, the pathway mapping methodology and background information about the respondent. To facilitate continuity and continued partnership in the validation process, experts invited to the in-depth consultation were also invited to the online consultation. To reach a broader group of stakeholders, the online consultation was promoted through social media and research information management systems (RIMs). The survey was open from 8 March 2018 to 8 April 2018 and received 31 complete responses. The list of participants in the online consultation is found in Appendix 20.

12. Framework structure

Competence areas; competences; description; Adequate performance level (or proficiency level).

There is no complete table like in DigComp 2.1, it is only mentioned in the examples see. Pg. 73, 76, 78, 82, 85.

13. Definition of digital competence, digital literacy etc. proposed by the framework

Hence, we propose the following definition for digital literacy:

Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competences that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy.

Our observations during the various stages of our empirical work show that there is a general acceptance that competence in digital literacy requires the person to have the necessary knowledge and skills, but views differ regarding attitudes. We hold the view that attitudes are necessary for a person to have the commitment and motivation to achieve competent performance, and should be

included in the DLGF.

14. Competences proposed by the framework (areas, dimensions, competences, knowledge, skills and attitudes, levels of proficiency, etc.)

Our observations during the various stages of our empirical work show that there is a general acceptance that competence in digital literacy requires the person to have the necessary knowledge and skills, but views differ regarding attitudes. We hold the view that attitudes are necessary for a person to have the commitment and motivation to achieve competent performance, and should be included in the DLGF.

Competence areas and competences

0. Devices and software operations**

0.1 Physical operations of digital devices**

0.2 Software operations in digital devices**

1. Information and data literacy

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

1.2 Evaluating data, information and digital content

1.3 Managing data, information and digital content

2. Communication and collaboration

2.1 Interacting through digital technologies

2.2 Sharing through digital technologies

2.3 Engaging in citizenship through digital technologies

2.4 Collaborating through digital Technologies

2.5 Netiquette

2.6 Managing digital identity

3. Digital content creation

3.1 Developing digital content

3.2 Integrating and re-elaborating digital content

3.3 Copyright and licences

3.4 Programming

4. Safety

4.1 Protecting devices

4.2 Protecting personal data and privacy

4.3 Protecting health and well-being

4.4 Protecting the environment

5. Problem-solving

- 5.1 Solving technical problems
- 5.2 Identifying needs and technological responses
- 5.3 Creatively using digital technologies
- 5.4 Identifying digital competence gaps
- 5.5 Computational thinking**

6. **Career-related competences****

- 6.1 Operating specialised digital technologies for a particular field**
- 6.2 Interpreting and manipulating data, information and digital content for a particular field**

Note: In the competence areas and competences column, text in bold indicates competence areas and plain text indicates competences.

** Added competence areas and competences which are not in the DigComp 2.0 framework.

15. **Examples of use**

To provide meaningful guidelines for the provision of training, monitoring and assessment of digital literacy associated with employment, decent jobs and entrepreneurship in disparate contextual settings, we were inspired by the examples for employment and learning found in the DigComp 2.1 framework, which are grounded in specific contexts. We have decided to gather an additional form of empirical input to inform the digital literacy framework development: collecting examples of digital literacy use in everyday contexts in a wide range of countries outside of Europe, particularly those within the specified geographical regions.

Our examples were selected from six sectors: four are major economic and/or employment sectors (agriculture, energy, finance and transportation) that are important in low-income countries, and two involve technology use for empowerment of communities suffering from systemic economic, social and political vulnerabilities (low-skilled and low-literate women in poor communities and displaced populations such as refugees).

Use Case Example Comparison Tables for Two Economic Areas

Tables 1 and 2 compare the dimensions, competences and proficiency

required for adequate performance for use cases. Table 1 compares three use case examples in agriculture, showing different levels of sophistication in the deployment of technology to enhance the productivity and profit of farmers. Table 2 compares two use cases in government, showing different levels of sophistication in the deployment of technology to enhance the productivity of entrepreneurs and bidders in government systems. The examples in both tables are numbered for a progression or pathway.

Table 8.1. A comparison of three use case examples in agriculture

Table 8.2. A comparison of two use case examples in e-government

16. Indications for the elaboration of instruments based on the framework

pathway mapping methodology to guide countries, sectors, groups and individuals to develop strategies and plans for advancing their own digital literacy development goals and pathways *Pathway mapping methodology*

Os autores dão muito destaque para a metodologia mas a achei muito conceitual e pouco prática. Não existe um passo a passo definido.

Hence, in order that the DLGF can be a useful resource to guide digital literacy development and assessment for diverse country and sector contexts, the project team has developed a pathway mapping methodology to guide countries, sectors, groups and individuals to develop strategies and plans for advancing their own digital literacy development goals and pathways. A pathway for digital literacy development can be developed through comparing case examples for specific targeted contexts to identify the difference in digital literacy competences required for acceptable performance between the popular current use and the use scenario to aspire to. Using this mapping methodology, stakeholders at different levels of the system in different country/sector/personal contexts can customise their own digital literacy development plan.

We propose that designing curricula and assessments around case examples may be a more effective approach to address different country contexts. Defining digital literacy levels and assessments at the practical level by case examples, and not at the conceptual level in frameworks, results in a non-linear and contextualised approach.

Appendix 8 presents a detailed pathway mapping methodology and

includes two sample pathways based on agriculture (see Appendix 9) and e-government (see Appendix 10). Each pathway comprises competences and contexts using examples for countries at different levels of development. A pathway may involve more than one technology type or sector, which shows how digital literacy competences for employment, decent jobs and entrepreneurship are closely linked with a set of inter-related sectors and technologies. We find three possible types of progression in competences in such pathways: i) increasing the proficiency level for acceptable performance within the same competence where more sophisticated digital devices or software systems are used; ii) the development of new competences; and iii) changes in the relative importance of specific competences due to changes in application areas or technology advances.

17. Miscellaneous

Table 5. Proposed competence areas and competences for the Digital Literacy Global Framework

Competence areas and competences	Description
0. Devices and software operations**	To identify and use hardware tools and technologies. To identify data, information and digital content needed to operate software tools and technologies.
0.1 Physical operations of digital devices**	To identify and use the functions and features of the hardware tools and technologies.
0.2 Software operations in digital devices**	To know and understand the data, information and/or digital content that are needed to operate software tools and technologies.
1. Information and data literacy	To articulate information needs, to locate and retrieve digital data, information and content. To judge the relevance of the source and its content. To store, manage and organise digital data, information and content.
1.1 Browsing, searching and filtering data, information and digital content	To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them. To create and update personal search strategies.
1.2 Evaluating data, information and digital content	To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content. To analyse, interpret and critically evaluate the data, information and digital content.
1.3 Managing data, information and digital content	To organise, store and retrieve data, information and content in digital environments. To organise and process them in a structured environment.
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 identity and reputation.
2.1 Interacting through digital technologies	To interact through a variety of digital technologies and to understand appropriate digital communication means for a given context.
2.2 Sharing through digital technologies	To share data, information and digital content with others through appropriate digital technologies. To act as an intermediary, to know about referencing and attribution practices.

2.3 Engaging in citizenship through digital technologies	To participate in society through the use of public and private digital services. To seek opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies.
2.4 Collaborating through digital technologies	To use digital tools and technologies for collaborative processes and for co-construction and co-creation of resources and knowledge.

Competence areas and competences	Description
2.5 Netiquette	To be aware of behavioural norms and know-how while using digital technologies and interacting in digital environments. To adapt communication strategies to the specific audience and to be aware of cultural and generational diversity in digital environments.
2.6 Managing digital identity	To create and manage one or multiple digital identities, to be able to protect one's own reputation, to deal with the data that one produces through several digital tools, environments and services.
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 licenses are to be applied. To know how to give understandable instructions for a computer system.
3.1 Developing digital content	To create and edit digital content in different formats, to express oneself through digital means.
3.2 Integrating and re-elaborating digital content	To modify, refine, improve and integrate information and content into an existing body of knowledge to create new, original and relevant content and knowledge.
3.3 Copyright and licences	To understand how copyright and licences apply to data, information and digital content.
3.4 Programming	To plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task.
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 well-being and social inclusion. To be aware of the environmental impact of digital technologies and their use.
4.1 Protecting devices	To protect devices and digital content, and to understand risks and threats in digital environments. To know about safety and security measures and to have due regard to reliability and privacy.

4.2 Protecting personal data and privacy	To protect personal data and privacy in digital environments. To understand how to use and share personally identifiable information while being able to protect oneself and others from damages. To understand that digital services use a “Privacy policy” to inform how personal data is used.
4.3 Protecting health and well-being	To be able to avoid health-risks and threats to physical and psychological well-being while using digital technologies. To be able to protect oneself and others from possible dangers in digital environments (e.g. cyber bullying). To be aware of digital technologies for social well-being and social inclusion.
4.4 Protecting the environment	To be aware of the environmental impact of digital technologies and their use.

Competence areas and competences	Description
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.
5.1 Solving technical problems	To identify technical problems when operating devices and using digital environments, and to solve them (from trouble-shooting to solving more complex problems).
5.2 Identifying needs and technological responses	To assess needs and to identify, evaluate, select and use digital tools and possible technological responses to solve them. To adjust and customise digital environments to personal needs (e.g. accessibility).
5.3 Creatively using digital technologies	To use digital tools and technologies to create knowledge and to innovate processes and products. To engage individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in digital environments.
5.4 Identifying digital competence gaps	To understand where one’s own digital competence needs to be improved or updated. To be able to support others with their digital competence development. To seek opportunities for self-development and to keep up-to-date with the digital evolution.
5.5 Computational thinking**	To process a computable problem into sequential and logical steps as a solution for human and computer systems.
6. Career-related competences**	To operate specialised digital technologies and to understand, analyse and evaluate specialised data, information and digital content for a particular field.

6.1 Operating specialised digital technologies for a particular field**	To identify and use specialised digital tools and technologies for a particular field.
6.2 Interpreting and manipulating data, information and digital content for a particular field**	To understand, analyse and evaluate specialised data, information and digital content for a particular field within a digital environment.

Table 8.1. A comparison of three use case examples in agriculture

	Use case example	1. A farmer in India makes better farming and trading decisions using a mobile phone service.	2. A farmer in Uganda conveniently buys and sells product through a smart phone app.	3. A farmer makes a data-driven irrigation system through Arduino
	Economic area of use case	Agriculture	Agriculture	Agriculture
	Role(s) of the person(s) using the digital technology	Farmer	Farmer	Farmer
	Digital technology used	Mobile phone with voice call and SMS capability	A smartphone with Internet connectivity	Arduino program; USB plug; moisture sensors; wires and transmitters; power supply; (water) tank supply sensor; relay; clock; LCD display; laptop
	Software applications (if applicable)	Not applicable	Agro Market Day	Arduino program
Competence area	Competences	Adequate performance level	Adequate performance level	Adequate performance level
0. Devices and software operations	0.1 Physical operations of digital devices	The farmer can input a simcard, charge his mobile phone and turn it on. The farmer can carry his phone while working.	The farmer can input a simcard, charge his smart phone and turn it on. The farmer can carry his phone while working. The farmer knows how to take a picture with the smart phone camera.	The farmer can properly power the system and read its setting on an LCD display, or on a laptop. The farmer can plug in Arduino into a powered laptop via USB. The farmer can place sensors at appropriate depth in soil and locations in field, and place watering devices at appropriate height and location.

	0.2 Identifying software to operate digital technologies		The farmer can set up the smart phone operating system settings and is aware of Internet connectivity.	
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content	The farmer can receive four to five personalized SMS messages each day about weather, market prices and farming practices. The farmer can navigate the mobile phone interface to find relevant messages.	The farmer is able to search for and download the Agro Market Day app from the Android store. The farmer can search for a particular product in the app and view listings. The farmer can also browse agricultural news and access prices from several markets.	

	1.2 Evaluating data, information and digital content	The farmer can compare prices in different markets and decide on a market to sell his product on a particular day.	The farmer can compare prices in different markets. A farmer can evaluate recommendations for where to buy genuine agricultural tools and inputs (herbicides; pesticides; fertilizers; etc.) and make purchase decisions.	The farmer can compare Arduino and clone specifications to determine which type to purchase.
	1.3 Managing data, information and digital content	The farmer can organize and delete the SMS messages on the phone.	The farmer can organize information on multiple prices for multiple products in multiple marketplaces to buy and to sell.	The farmer can organize code so that others can read it and comprehend it. A farmer can keep track of times and dates of irrigation.
2. Communication and collaboration	2.1 Interacting through digital technologies	The farmer can call other farmers and show information to other farmers.	A buyer can call a seller and arrange time, date and location for transaction. The farmer with the smartphone can cooperate with the farmer without a smartphone and a buyer to transact.	The farmer can reach out to the Arduino online community to learn to program and to troubleshoot programs, and to Arduino farming community to learn appropriate ways to physically connect an irrigation system and to program it.
	2.2 Sharing through digital technologies		A farmer with a smartphone can cooperate with a farmer without a smartphone to post produce advertisements on the app for the	

			farmer without a smartphone.	
	2.3 Engaging in citizenship through digital technologies			
	2.4 Collaborating through digital technologies			
	2.5 Netiquette			
	2.6 Managing digital identity			
3. Digital content creation	3.1 Developing digital content		The farmer takes pictures of his product, and uploads that with price,location and a phone number to the app.	
	3.2 Integrating and re-elaborating digital content			
	3.3 Copyright and licences			
	3.4 Programming			The farmer can define constants on the programming interface, pins, themaximum dryness, and the water delay and water post-delay. The farmer can program a loop to read sensor value, compare it, and to takeaction with water and delay if the soil is too dry. The farmer can reprogram the system to irrigate based on time, or to irrigate based on fertilizer not water.
	4.1 Protecting devices		The farmer is able to register the appand log in with a phone number and password.	

4. Safety	4.2 Protecting personal data and privacy		The farmer does not disclose password or sensitive information about himself or a fellow farmer.	
	4.3 Protecting health and well-being			
	4.4 Protecting the environment			
5. Problem solving	5.1 Solving technical problems			The farmer can refer to sample code in Arduino to learn to program. The farmer can reach out to the Arduino online community to learn to program and to troubleshoot programs, and to Arduino farming community to learn appropriate ways to physically connect an irrigation system and to program it.
	5.2 Identifying needs and technological responses		A farmer without a smartphone identifies the approach to cooperate with a farmer with a smartphone and Agro Market Day to post advertisements of the farmer's product. A farmer decides on whether to post an advertisement for product to go to a market based on prices at marketplaces.	
	5.3 Creatively using digital technologies			
	5.4 Identifying digital competence gaps			
	5.5 Computational thinking			
6. Career-related competences	6.1 Operating specialized digital technologies for a particular field			
	6.2 Interpreting data, information and digital content for a particular field			

Table 8.2. A comparison of two use case examples in e-government

	Use case example	1. An entrepreneur registers for a Dubai MyID single sign-on to access required government online services to do business	2. A supplier submits a bid through the Government of Mauritius e-Procurement System
	Economic area of use case	Government	Government
	Role(s) of the person(s) using the digital technology	Entrepreneur	Bidder for government supplier

	Digital technology used	Emirates ID card; kiosk or PC or laptop with smart-card reader; mobile or smart phone; Internet connectivity	PC or laptop; Internet connectivity
	Software applications (if applicable)	Internet browser; government service apps	Compatible Windows operating system; Office software; compatible Internet browser; Java; Adobe Acrobat Reader; digital signature certificate; anti-virus software
Competence area	Competences	Adequate performance level	Adequate performance level
0. Devices and software operations	0.1 Physical operations of digital devices	The entrepreneur can visit a kiosk within the city to register or if the entrepreneur doesn't want to visit a kiosk, the entrepreneur can turn on a computer, and attach a smart card reader. The person can insert the Emirates ID into the kiosk or the smart card reader. He/she can place finger on sensor for scanning.	The bidder can turn on a computer.
	0.2 Identifying software to operate digital technologies	The entrepreneur can respond to prompts for Emirates ID card insertion and fingerprint scanning. The person is aware of Internet connectivity, proper and successful card insertion and appropriate and successful fingerprint scanning.	The bidder can check the prerequisite hardware and software system requirements against the bidder's hardware and software system. The person can respond to the website and web browser prompts and to unblock content, to allow pop-up windows, and to install a Java utility on the bidder's system. He/she is aware of different file types, and can decompress a file comprising documents. The person recognizes required personal information on the form.
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content	The entrepreneur can open a web browser, and input the registration webpage address in the appropriate box in the browser. The person can	The bidder can open a web browser, and go to the Government of Mauritius e-Procurement System website. From the landing page, the person can scan and skim the content in the How to?, FAQ, Help Desk,

		identify and interpret icons and buttons, input boxes and forms on the interface. He/she can advance to the next screen in the registration process. The person can browse and select relevant government services. At a government service login, he/she can click on the MyID icon.	and Standard Bidding Docs sections of the website to find relevant information on successfully making a bid. He/she checks an email account, including its SPAM folder, to find an email from the e-Procurement system. The person opens the email and clicks on a link to confirm the registration. He/she can interpret action icons in the IFB interface. The person can search for, and select relevant invitations for bids (IFBs) from the user account dashboard. He/she can click on Proceed to go to the next screen in the IFB preparation page sequence. The person can identify drop down menus, text boxes, adding rows and importing data on forms.
	1.2 Evaluating data, information and digital content		The bidder can preview invitations and bid templates.
	1.3 Managing data, information and digital content	The entrepreneur can note down his Emirates ID PIN to register for MyID. The person can note down his MyID username and password to access government online services.	The bidder uploads specific file types and multiple files from his system into an e-Procurement system field. The person can prepare a bid by downloading IFB documents individually or in a compressed file to a location on the person's system. He/she can receive and read email updates on the IFB. The person identifies and notes down applicable fees for the IFB.
2. Communication and collaboration	2.1 Interacting through digital technologies		
	2.2 Sharing through digital technologies		
	2.3 Engaging in citizenship through digital technologies		
	2.4 Collaborating through digital technologies		
	2.5 Netiquette		
	2.6 Managing digital identity		
3. Digital content creation	3.1 Developing digital content		
	3.2 Integrating and re-elaborating digital content		
	3.3 Copyright and licences		

	3.4 Programming		
4. Safety	4.1 Protecting devices	An entrepreneur can keep a physical Emirates ID card and set and recall a PIN to access information from the card. The person can enter username and	The bidder inputs personal information and security information, including Captcha and security

		password in a form on a separate page to access a government service, and then close the sign on page.	questions, on the form through single text boxes. The person logs in with a username and password.
	4.2 Protecting personal data and privacy	The entrepreneur can register a new account by selecting and inputting an existing email address and a password twice in text boxes. The person can select and input an existing mobile phone number and Emirates ID number in the form. The entrepreneur can select and input personal information, including physical address, and fingerprint scan.	The bidder can read the Terms of Use and accept the terms by clicking a check box. At the user account dashboard, the person registers his organization by first clicking on My Registration. He/she identifies required information on a form and decides whether or not to input optional information on the form. The person saves the form and encrypts data. He/she can choose and attach digital certificates to the template. The person submits the bid and identifies and notes down the hash values of the bid. The He/she can revise the bid application until the closing date for bid submission by clicking on decrypt.
	4.3 Protecting health and well-being		
	4.4 Protecting the environment		
5. Problem solving	5.1 Solving technical problems	The entrepreneur can follow and meet format input requirements for the password, mobile phone number and ID.	The bidder can meet the type or format of acceptable input by clicking the information button beside the input field and seeing a green check mark or a red check mark beside the field.
	5.2 Identifying needs and technological responses	On the registration webpage, the entrepreneur can identify the options to change language and to find more information, including kiosk locations through Google maps, and contact information telephone number and email address.	The bidder can search the system website and other websites to find and follow relevant information on how to navigate the system interface.
	5.3 Creatively using digital technologies		

	5.4 Identifying digital competence gaps		
	5.5 Computational thinking		
6. Career-related competences	6.1 Operating specialized digital technologies for a particular field 6.2 Interpreting data, information and digital content for a particular field		

Figure 1. A map of the geographic locations of the countries for which the frameworks have been collected



Note: Some countries have more than one framework belonging to the same framework type. Only one icon is shown for each framework type collected for that country. A limitation of the map generation software is that some icons overlap with each other. Appendix 1 provides an accurate list of the distribution of frameworks analysed across countries.

commercial enterprises

We found a total of three different enterprise frameworks adopted by the 43 countries that use them, in decreasing order of popularity: a. International Computer Drivers Licence (ICDL)¹—adopted in 31 countries; b. Certiport Internet and Computing Core Certification (IC³)²—adopted in 13 countries; and c. Microsoft Digital Literacy Standard Curriculum³—adopted in 11 countries. Why not include these in the analyzed list?

While the content coverage found in the digital literacy frameworks varies, there are generally five types of content: purpose of the framework, competence areas and competences, learning domains (such as knowledge, skills and attitudes), how the tasks are to be performed and the digital tools to be used.

In the mapping process, we have identified two areas of digital literacy competences that may not most appropriately capture the contexts and concerns reflected in the frameworks if the mapping were to be confined only to those competence areas and competences in the DigComp framework: 1. Devices and software operations (CA0)—This relates to basic operations of the digital devices,

such as turning them on and off, understanding basic concepts of hardware and software, and operations on a graphical user interface. 2. Career-related competences (CA6)—These refer to competences in the use of digital technologies that are important productivity tools for particular business sectors. Examples include competences in using Learning Management Systems for teachers, computer-aided design (CAD) and computeraided manufacturing (CAM) applications for architects, engineers and construction workers, health information systems for medical practitioners, and social media for marketing professionals. Careerrelated competences are included in two of the three enterprise frameworks, the ICDL and the Microsoft Digital Literacy Standard Curriculum.

3.4 Proficiency levels and assessment The DigComp 1.0 competence framework proposed three proficiency levels, which was later expanded to eight proficiency levels in DigComp 2.1 (DigComp 2.1 contains no conceptual updates to DigComp 2.0 competence areas and competences but it includes updates to proficiency levels and examples of use), defined systematically and accompanied by examples. However, none of the digital literacy frameworks we collected provide such comprehensive proficiency level descriptions. In frameworks that serve as the basis for K-12 curriculum development, grade levels in formal schooling are often used as proxies for defining proficiency levels. Other frameworks may use broad descriptors such as initial, intermediate and advanced (e.g. in the Chilean SIMCE TIC framework).

Our examples were selected from six sectors: four are major economic and/or employment sectors (agriculture, energy, finance and transportation) that are important in low-income countries, and two involve technology use for empowerment of communities suffering from systemic economic, social and political vulnerabilities (low-skilled and low-literate women in poor communities and displaced populations such as refugees).

3 enterprise frameworks – são incluídos neste, são entepise, não aparecem nos outros, educação ou não – mais voltados para o trabalho?

O de British Columbia é nacional.

The most popular devices that are used by the majority of adults are mobile devices, such as mobile phones, smart phones, and tablets.

In developing the draft Digital Literacy Global Framework (DLGF) and in mapping the examples, the project team found that the specific digital literacy competences and proficiency levels that are important depend on their specific country and economic sector contexts.

When asked if there were any missing digital literacy competences to be added to the framework, the most cited missing competence (n=3) was computational thinking, which has increasingly gained wide global attention. While some may consider computational thinking to be part of programming (competence 3.4), most of the current focus is on algorithmic thinking as an integral part of problem-solving competences in the digital world and not necessarily involving programming in specific computer languages. After discussions with experts, the project team decided to add computational thinking to the proposed framework as competence 5.5 for the online consultation.

Priorities in the field of digital literacy will differ depending on socioeconomic contexts and the level of development of a country.

there is not a one-size-fits-all assessment of digital competence that can serve all purposes and contexts

collaboration on the implementation of the pathway mapping methodology to generate digital literacy training and assessment programs may provide a fertile context for collaboration among entities in diverse socio-political and economic contexts without the prior establishment of a common DL framework among the collaborating agencies.

Most digital literacy frameworks reviewed in this report do not specify proficiency levels for competences

Countries have approached digital literacy in varying ways conceptually and in practice. The DigComp 2.0 competence framework addresses contexts in European countries, which are typically high-income and technologically-developed. . To cater for different country needs on a global scale, the proposed framework has added competences, such as CA0, Devices and software operations, and CA6, Career-related competences, as well as competence 5.5, Computational thinking.