# Proposal for Amendments to the ITU Guiding Documents on ICT Skills Measurement

**Submitted by the Expert Group on ICT household Indicators, Sub-group on Measuring ICT Skills Using Household Surveys**

## Background

Following a proposal stemming from the 5th Meeting of the ITU (International Telecommunication Union) Expert Group on ICT (Information and Communication Technology) Household Indicators (EGH) in September, 2017, a sub-group ("EGH-Skills") was created within the EGH to improve the guiding documents related to the measurement of ICT skills based on ICT household data.

A call for volunteers was put out to the overall Experts Group on Household Indicators and the experts sub-group was assembled in January 2018. The group is comprised of experts in the fields of both ICT skills and ICT measurement through official surveys, and consists of delegates from Brazil, Canada, Egypt, Ghana, Iran, Korea, Saudi Arabia, Tunisia, and experts from Devstat, the European Commission, ITU, the London School of Economics and the OECD.

## Objectives

Terms of reference for the work were developed (Annex 1) with the objective being four-fold:

1. Develop or adopt a conceptual framework and dimensions of digital skills to be monitored through household surveys;
2. Review the response categories in indicator HH15 to take into account skills beyond computer-related skills;
3. Conduct a review of indicator HH9 to ensure the response categories reflect common Internet activities at various levels of difficulty that can be used to measure individuals' digital skills, including an assessment of reducing the number of Internet activities in the question; and
4. Evaluate the possibility to aggregate relevant indicators into one or several ICT skills indicator(s).

## Outcomes

The outcomes of the subgroup, organized hereunder by initial objective, were obtained through a combination of collaborative video conferences and submissions of relevant studies, comments and proposals. The proposals herein have been reviewed by the expert

sub-group and are put forward for the consideration of the overall Expert Group on ICT Household Indicators.

## 1. Develop or adopt a conceptual framework and dimensions of digital skills to be monitored through household surveys

The sub-group was faced with the possibility of developing a conceptual measurement framework of ICT skills or adopting one that was already in place. It was decided that using a previously developed framework would provide many benefits, including that of comparability. The EGH-Skills sub-group proposes the adoption of the European Commission's Digital Competence Framework for Citizens (DigComp 2.0) as the conceptual framework to be used going forward to help guide the measurement of ICT skills.

A comprehensive review of the extensive and thorough research conducted by the Joint Research Centre of the European Commission led the group to determine this was the most appropriate choice. This framework has the advantages of being comparable amongst a large number of countries, as well as being maintained and updated on an ongoing basis to reflect the changing nature of ICT skills.

The framework has five major areas of skills measurement:
- Information and data literacy
- Communication and collaboration
- Digital content creation
- Safety
- Problem-solving

Each of the twenty-one competences identified in the framework can be categorized into one of these areas.

Following the sub-group's ratification of this decision to adopt DigComp 2.0, the guiding principles of the framework helped to complete the review and evaluation of the structure and effectiveness of questions HH9 and HH15.

### Key outcomes

The adoption of the European Commission's Digital Competence Framework for Citizens is proposed to guide the monitoring of skills development and measurement of skills indicators

on the ITU model questionnaire. The entire framework can be found at the following link: http://europa.eu/!HV34YF.

## 2. Review the response categories in indicator HH15 to take into account skills beyond computer-related skills

### Adoption of device-agnostic wording

Given the growing popularity and use of devices other than traditional home and laptop computers to undertake the online activities that were previously characterized only by these two devices, the adoption of device-agnostic wording for the indicators related to HH15 is proposed. There is an acknowledgement that within some countries, there may be a specific policy need to understand ICT skills within the context of a certain type of device; for example, in Canada, a module of the Canadian Internet Use Survey is dedicated to activities carried out on a smartphones, due to the policy interest in this area.

However, from a measurement perspective, many of the skills that are of interest are not device-specific. The focus on activities carried out on a certain device (e.g. computer) can lead to confusion among respondents, or false-negative responses; it also results in a continual need to change survey tools as the capabilities of different devices evolve.

### Reorganization of questions to reduce redundancy and fill the measurement gap of digital skills

Over time, as the need for particular skills indicators has grown, additional activities were added to the list of answer options in HH15 to match the list of competencies outlined in DigComp 2.0; this lead, at times, to skill elements being added to new questions that were already measured in other questions. Recognizing this, a review of the response categories for question HH15 was conducted by the EGH-skills group, resulting in proposed improvements to provide more relevant and accurate indicators of skills, while limiting the number of answer options. An updated list of activities is proposed in Table 1.

In meeting the objectives of this specific review, the sub-group recognizes that the reduction of questions may not suit the needs of all member states; for instance, policy needs often go beyond the measurement of targeted skills, and the usefulness of broader activity-based statistics is conceivable. As such, countries' policy and data requirements may dictate the need to integrate activity-based questions beyond the list of those compiled with a lens to succinctly measure digital skills.

Overall, it is proposed that one of the indicators from HH15 be dropped (highlighted in red in Table 1). With a modification to HH15.2, skills elements from the former HH15.1 and HH15.2 will be sufficiently jointly covered for accurate measurement. It should be noted that HH9.29 would be deleted to reduce duplicate measurement of the indicator.

The addition of two new indicators (highlighted in green) is also proposed to fill the current gap on the measurement of users' ability to protect themselves and their personal information online.

*Table 1: Proposed amendments to HH15*

| Former HH15 answer-set formulation: computer-related activities | Proposed HH15 answer-set formulation: device-agnostic activities |
|---|---|
| 1. Copying or moving a file or folder | The skill measured by this indicator overlaps with 15.2 below and this can be dropped |
| 2. Using copy and paste tools to duplicate or move information within a document | *Using copy and paste tools to duplicate or move data, information and content in digital environments (e.g. within a document, between devices, on the cloud)* |
| 3. Sending e-mails with attached files (e.g. document, picture, video) | *Sending messages (e.g. e-mail, messaging service) with attached files (e.g. document, picture, video)* It may be worth providing a non-Internet related example that is clearer than 'messaging service' to ensure offline messaging via digital devices is considered by respondents. |
| 4. Using basic arithmetic formulae in a spreadsheet | No change |
| 5. Connecting and installing new devices (e.g. a modem, camera, printer) | Connecting and installing new devices (e.g. a modem, camera, printer) through wired or wireless technologies |
| 6. Finding, downloading, installing and configuring software | *Finding, downloading, installing and configuring software and apps* |
| 7. Creating electronic presentations with presentation software (including text, images, sound, video or charts) | From a skills perspective, this overlaps with HH9.29. Therefore, HH9.29 is proposed for deletion. |
| 8. Transferring files between a computer and other devices | *Transferring files or applications between devices (including via cloud-storage)* Redundancy may still remain between 15.8, 15.2 and 15.3. |
| 9. Writing a computer program using a specialized programming language | *Programming or coding in digital environments (e.g. computer software, app development)* Proposed to add further detail on the definition of a specialized programming language. While this |

| | language may suffice for this documentation, countries should provide this detail as they see fit. |
|---|---|
| Modification of security settings | *Setting up effective security measures (e.g. strong passwords, log-in attempt notification) to protect devices and online accounts* |
| Changing privacy settings to protect personal information | *Changing privacy settings on your device, account or app to limit the sharing of personal data and information (e.g. name, contact information, photos)* |

### Redefinition of target population to ensure measurement amongst users of all devices

Given that HH15 was previously asked to a subpopulation that would have been previously filtered using a question ascertaining respondents' use of a computer, the redefinition of the target population is proposed to comprise all respondents – not only Internet users – to facilitate the change to device-agnostic skills measurement.

It should be noted, however, that while the change in target population allows for device-agnostic measurement, it does not allow for direct comparison with HH9.

### Key outcomes

It is proposed to adopt device-agnostic wording for HH15 to recognize that the skills being measured are not limited to computer use and that activities associated with the skills can be developed and demonstrated through a continually growing number of devices.

A redefinition of the target population is proposed to ensure appropriate measurement amongst all Internet users.

Amendments to the response categories have also been proposed to reduce redundancy and fill data gaps in the skills that are currently measured.

### Future Work

The work undertaken by the Expert Group on the revision of the HH15 concluded on a number of avenues for future work.

A sub-dimension of the DigComp 2.0 framework refers to the critical evaluation of information (i.e. assessing the validity of information, including potential 'fake news'). Despite the absolute policy relevance of this dimension, the group considered that the frontier is rather blurred between individual perceptions/attitudes and their skills/abilities to undertake this task. It is, therefore, proposed that future work be undertaken to assess the need, and determine proper indicators, for critical evaluation of information.

In regard to the DigComp 2.0 pillar on problem-solving skills, the group discussed and agreed that such skills are rather difficult to effectively measure through ICT usage surveys based on individuals' self-declarations. Other international organisations drive such metrics from skills assessment surveys (e.g. OECD Programme for the International Assessment of Adult Competencies - PIAAC) based on actual performance evaluation in a situation that requires problem solving. The ITU is encouraged to learn from the experiences of member states as national statistical agencies integrate such subject matters into their questionnaires.

Finally, it has been noted that, with the current list of HH15 questions, one of the five areas of the DigComp 2.0 framework remains unassessed: finding and evaluating information and digital content. While covered in HH9.1, both questions (HH9 and HH15) are not asked to all users, leaving a gap in the assessment. It is proposed that this area be addressed in the future.

3. Review of indicator HH9 to ensure the response categories reflect common Internet activities at various level of difficulties that can be used to measure individuals' digital skills, including an assessment of reducing the number of Internet activities in the question

An initial review of HH9 demonstrates the need for revision as it currently lists 29 activities, making it a cumbersome tool for both those who conduct surveys and respondents that complete them.

Although this exercise looks at HH9 through a skills lens, it is important to remember that the objective of HH9 is to shed light on individuals' online activities. For that reason, and to remain relevant and inclusive about activities to monitor, the proposed competence framework can also be useful. That some of the indicators can be used to assess respondents' skills is an added benefit but cannot be, and has not been, over the course of the review, the only motivation for making changes in the question.

Table 2 summarizes the potential for exclusion or modification of indicators based on their overlap with the measurement of skills covered by other indicators; indicators' overall relevance was also considered in determining the need for revision. Greyed-out indicators denote areas for potential improvements based on overlap; red-shaded indicators are candidates for deletion due to irrelevance; and, those in white designate, mainly, indicators that could benefit from definitional changes. Of course, country-specific needs could not be

considered in suggesting amendments, thus, the list serves only as a baseline for comprehensively measuring skills in line with DigComp 2.0, and not covering activities exhaustively.

A mapping of these current indicators to DigComp 2.0 demonstrated that most of the focus of ITU indicators was on measuring skills under the 'Communications and Collaboration' and 'Information and Data Literacy' categories of the adopted framework. Only weak linkages, if any, with a limited number of skills associated with 'Online Safety' and 'Problem Solving' were identified.

*Table 2: Proposed amendments to HH9*

| Current HH9 response category | Proposed potential for exclusion or modification |
|---|---|
| **Access to Information** | |
| 1.    Getting information about goods or services | There is little difference in the application of skills between this task and 9.1, 9.2, 9.15, and 9.20. |
| 2.    Seeking health information (on injury, disease, nutrition, etc.) | (See comment in 9.1)<br><br>*Seeking health-related information (on injury, disease, nutrition etc.)* |
| 4.    Getting information from general government organizations | (See comment in 9.1) |
| 9.    Accessing chat sites, blogs, newsgroups or online discussions | *Accessing or posting opinions via any device on chat sites, blogs, newsgroups or online discussions (e.g. on civic or political issues, general interest topics) that may be created by any individual or organization*<br><br>Amended to included activity elements from 9.26, which would be eliminated. |
| 12.   Using services related to travel or travel-related accommodation | Overlap with skills needed for 9.3. Furthermore, unsure of overall relevance globally; this may be too restrictive to be a skill indicator. There may still be interest to keep the indicator as an activity worth measuring. |
| 19.   Downloading software or applications (includes patches and upgrades, either paid or free of charge) | This indicator could be deleted based on its overlap with HH15.6 |
| 20.   Reading or downloading online newspapers or magazines, electronic books (includes accessing news websites, either paid or free of charge) | *Reading or downloading newspapers, magazines or electronic books in a digital format*<br><br>This should be clear that it includes access through websites and/or apps regardless of device. |
| **Communication and collaboration** | |
| 3.    Making an appointment with a health practitioner via a website | *Making an appointment with a health practitioner via the Internet (i.e. website, app, software)* |

| | |
|---|---|
| | Overlap with skills required to undertake 9.3 and 9.12 in terms of using online calendars and assessing availability, and with 9.5 due to health practitioners, at least in many cases and for many countries, being government organizations, and with 9.21 in other ways. |
| 5. Interacting with general government organizations (downloading/requesting forms, completing/lodging forms online, making online payments and purchasing from government organizations etc.) | (See comment in 9.3) |
| 6. Sending or receiving e-mail | Candidate for deletion: overlaps with skills needed to perform 9.6 and 9.7; overlaps with 15.3; and, requires a lower level of skill than 15.3 |
| 7. Telephoning over the Internet/VoIP (using Skype, iTalk, etc.; includes video calls via webcam) | Overlap with skills needed to perform 9.6, 9.7, and 15.3, falling into the DigComp framework's section 2.2 (interacting through digital technologies). While overlap exists, however, skills for this activity would seemingly different, or need to be higher, perhaps, justifying this answer option's continued inclusion. |
| 8. Participating in social networks (creating user profile, posting messages or other contributions to Facebook, Twitter etc.) | Overlap with skills needed to perform 9.8, 9.22, 9.24, and 9.26. A slight modification, perhaps, combining attributes of all, may result in one overarching indicator; for example, *"participating in social, professional, or academic networks via websites or apps (creating profiles, posting messages, sharing content, and providing opinions)"*. |
| 26. Posting opinions on civic or political issues via websites (blogs, social networks, etc.) that may be created by any individual or organization | Overlap with skills needed to perform 9.8, 9.22 and 9.24. Furthermore, activity closely linked with that of HH9.9.<br><br>HH9.9 amended to reflect these activities. |
| 27. Taking part in online consultations or voting to define civic or political issues | *Taking part in consultations or voting via internet to define civic or political issues (urban planning, signing a petition, etc.)* |
| **Electronic commerce, trade, and transactions** | |
| 10. Purchasing or ordering goods or services | No change |
| 11. Selling goods or services (via eBay, Mercado libre, Facebook, etc.) | There may be a need to update the platforms used as examples (i.e. Instagram) |
| 13. Internet banking | *Electronic financial transactions (e.g. online banking, money transfers, exchange of crypto-currencies)*<br><br>Proposed to expand the scope of this question to ensure financial transactions without traditional bank involvement. Identified as particularly important for developing countries. |
| **Learning** | |

| | |
|---|---|
| 14. Doing a formal online course (in any subject) | Proposal to drop the word 'formal' from the response category |
| 15. Consulting wikis (Wikipedia etc.), online encyclopedias or other websites for formal learning purposes | (See comment in 9.1) Also, proposal to drop the word 'formal' from the response category. |
| **Professional life** | |
| 21. Looking for a job or sending/submitting a job application (includes searching specific web sites for a job; sending/submitting an application online) | No change |
| 22. Participating in professional networks | Overlap with skills needed to perform 9.8, 9.24, and 9.26. There may need to provide examples (e.g. LinkedIn) |
| **Digital content consumption** | |
| 16. Listening to web radio (either paid or free of charge) | Overlap with skills needed to perform 9.17 and 9.18; does not map well to the skills framework and should only be maintained if determined to be a policy-relevant activity. |
| 17. Watching web television (either paid or free of charge) | Overlap with skills needed to perform 9.16 and 9.18; does not map well to the skills framework and should only be maintained if determined to be a policy-relevant activity. |
| 18. Streaming or downloading images, movies, videos or music; playing or downloading games (either paid or free of charge) | Overlap with skills needed to perform 9.16 and 9.17; does not map well to the skills framework and should only be maintained if determined to be a policy-relevant activity. |
| **Digital content creation** | |
| 23. Managing personal/own homepage | This question has mostly become obsolete as fewer individuals maintain a blog or personal homepage making it a candidate for deletion. A more interesting question from a skills perspective may be one related to managing one's personal identity online |
| 24. Uploading self/user-created content to a website to be shared (text, images, photos, videos, music, software, etc.) | Overlap with skills needed to perform 9.8, 9.22 and 9.26 |
| 25. Blogging: maintaining or adding contents to a blog | The activity and skills covered in HH9.24 have overtaken blogging as an activity and this could be dropped |
| **Cloud Computing** | |
| 28. Using storage space on the Internet to save documents, pictures, music, video or other files (e.g. Google Drive, Dropbox, Windows Skydrive, iCloud, Amazon Cloud Drive) | No change |
| 29. Using software run over the Internet for editing text documents, spreadsheets or presentations | Overlap with the skills needed to perform HH15.7, which many make it a candidate for deletion. The activitiy as it relates to Internet, however, may still be relevant for measurement |

| | and may be linked to security and trusting online service providers. |
|---|---|

In addition to the changes suggested above, the group proposes to integrate indicators in the questionnaire to provide measures of the following:

- Ability to evaluate the reliability of content that is found online (e.g. fake news)
- Awareness of the use of devices and/or the Internet as they relate to personal well-being; this could include topics such as cyberbullying, addiction and social exclusion
- Ability to recognize skills gaps and an individual's need for upskilling in the digital domain

A further assessment is required to determine if these skills would be better positioned if measured through question HH15.

### Classification of indicators

The indicators in HH9 have been classified into broader subject categories in Table 1 (rows in black) to reflect the working group's proposal to group similar activities together to enhance readability. It should be noted that many of the categories mimic those of the OECD Model Survey on ICT Access and Usage.

### Key outcomes

It is proposed that questions HH9.6, HH9.12, HH9.19, HH9.23, HH9.25, HH9.26, and HH9.29 be removed from the answer categories since they are activities of diminishing relevance. Also, that a review of questions that overlap skill categories be carried out to assess additional opportunities to eliminate response categories. Furthermore, it is proposed to develop indicators to measure additional topics related to evaluation of news sources and online safety, and to classify HH9 activities into broader groupings to enhance readability.

Finally, indicators have been classified by type of activity, in line with other international documentation, to enhance readability.

## 4. Evaluate the possibility to aggregate relevant indicators into one or several ICT skills indicator(s)

At this stage, the sub-group recognizes that it is not in a position to propose aggregate indicators of ICT skills (e.g. basic, moderate, and advanced user). Within the model questionnaire, the opportunity is certainly presented for countries to develop aggregate indicators, but this may provide greater value if conducted at the country level to take into account the relative importance assigned to each of the individual skills. Furthermore, the current list of activities seem to be skewed toward the basic user skill set.  While this allows for more relevance to a greater proportion of respondents, it may prove limiting if attempting to meaningfully assign aggregate skill levels for more sophisticated users.

The modification of the questionnaire based on the above proposals may allow for a more informed approach to doing so if there is an interest amongst members.

### Future Work

The development of relevant aggregate indicators has been identified as valuable and worth exploring further to allow for the delineation between individuals with 'basic' skill sets and those with more sophisticated skills.

The EU's Digital Economy and Society Index (DESI) was identified as a model for future consideration.  The indicator covers four competence domains (information, communication, content creation and problem solving), and four skills levels are captured (above basic, basic, low, and no skills). A technical note is available for review on the European Commission's website, as well as a visual of the resulting data.

### Key outcomes

It is proposed that further discussion take place to determine how best to tackle this work, and that the ITU follow the lead of member states as national statistical agencies undertake skills aggregation exercises.

# Annex 1 – EGH-Skills Terms of Reference

Annex 1 -
Subgroup on ICT ski