

Media and Information Literacy among Children on Three Continents: Insights into the Measurement and Mediation of Well-being

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In understanding and promoting positive outcomes for children's internet use, media and information literacies play a crucial mediating role, by enabling opportunities to learn, create, express oneself and participate, and by facilitating coping and building resilience. This chapter explains the approach taken by Global Kids Online (GKO), a multinational research partnership seeking to generate robust evidence that can inform policy and practice regarding children's internet use in diverse cities and countries internationally. The chapter presents the rationale for GKO's multidimensional approach to media and information literacy, and issues of measurement, social desirability and cross-national comparison. It shows recent findings showing cross-national similarities in higher levels of operational than creative skills as well as differences between higher and lower income countries; it is noteworthy that gender differences in children's digital skills are found to be small. Having shown that the GKO quantitative research toolkit successfully operationalises the range of media and information literacies also addressed by comparable international frameworks, we commend it to future researchers, concluding with evidence that the results of the GKO research are now being used to inform national policy and practice regarding children's learning in a digital age.

Keywords: Global Kids Online; online risk and opportunities; digital skills measurement; cross-national comparisons; policy implications

Introduction

As internet access grows around the world, with societies increasingly relying on digital connectivity for their daily functioning, it is crucial to understand whether people are able to act within digital environments, and what skills and literacies they require. It is already known that inequalities in well-being stem from inequalities in digital skills and engagement. Geo-mapping research shows that these inequalities in turn are pronounced in cities, differentiating among otherwise-similar families living in different neighbourhoods with different characteristics. In other words, part of what drives differences in literacy and well-being is the local context of the cities and neighbourhoods in which people live (Helsper, 2019; Mossberger, Tolbert, & Lacombe, 2021).

Little, however, is yet known regarding children in this regard, beyond the fact that both family and country or cultural factors shape children's opportunities and outcomes in crucial ways. Noting that UNESCO's "MIL Cities" initiative strives to connect cities around the world by providing a common understanding of MIL and empowering citizens with the MIL

competences, this chapter seeks to rectify the evidence gap regarding children, themselves an estimated one in three of the world's internet users (Livingstone, Carr & Byrne, 2015). We draw on research conducted by the Global Kids Online network which, like "MIL Cities," strives for a cross-national approach for measuring digital skills and to empowering children by treating them as active contributors to their online experiences.

The driving rationale for many societies to provide children with internet access internet is positive - to support their well-being, especially as regards education and learning. However, many studies have shown that access alone is insufficient to guarantee positive outcomes: education is needed to develop media and information literacies. They also show that support for access and literacies must attend to pre-existing inequalities (in gender, socio-economic status, ethnicity, disability and other factors) if those who are already-disadvantaged are not to lose out further (Banaji, Livingstone, Nandi, & Stoilova, 2018; Van Dijk, 2020). Moreover, the challenges posed by online risk of harm are often highest on the agenda of policy makers, raising questions as to whether digital skills can increase children's resilience and safety online.

Until recently, most research has examined the global North, with uncertain application or relevance to the global South, where most expansion of internet use is occurring. Focusing on children aged 9-17, the Global Kids Online network asks, first, when and how does use of the internet (and associated online, digital and networked technologies) contribute positively to children's lives, providing opportunities to benefit in diverse ways that contribute to their well-being? And second, when and how is use of the internet problematic in children's lives – amplifying the risk of harms that may undermine their well-being? (Livingstone, Kardefelt Winther, & Hussein, 2019). The network takes a holistic, child-rights approach to understanding how use of the internet has consequences for children's rights to participation, information, freedom of expression, education, and play, and to protection from harm (UN, 1989). It positions children's online skills and practices at the heart of its research framework, recognizing that children's digital skills mediate their opportunities to learn, create, express themselves and participate in digital environments, and their capacity to build resilience against online risk of harm (Livingstone, 2016).

In building its research framework, Global Kids Online began with the work of EU Kids Online, putting this into dialogue with insights from its country partners in Argentina, Brazil, Philippines, South Africa and elsewhere (Stoilova, et al., 2016). For digital skills, however, a fresh approach was required since the original EU Kids Online project focused on safety skills (Livingstone, Ólafsson, Helsper, Lupianez-Villanueva, Veltri, & Volkford, 2017). Thus, Global Kids Online collaborates with the DiSTO project (*From digital skills to tangible outcomes*) which has developed a multidimensional measure of digital skills, tested cross-nationally and linked to measures of inequalities, online activities and offline outcomes (Helsper, et al., 2015). While recognizing the history of debates over definitions and measurement that have sometimes undermined the promotion of media and information

literacies (e.g. Litt, 2013; Van Dijk, 2020), our concern is to present a practical approach to measuring children's digital skills across diverse countries as a step towards the larger aim of informing policy makers and practitioners seeking to develop the digital skills that mediate children's well-being and rights.

Measuring Digital Skills: The Approach of Global Kids Online

Early research and policy focused on operational or technical skills. Recognizing the expansion of digital technologies into different areas of everyday life, subsequent work has encompassed critical information literacy skills, socio-emotional capabilities, creative skills and digital participation. However, measuring digital skills has proved difficult, suffering problems of incompleteness, over-simplification or conceptual ambiguity. Particularly problematic is asking people if they can use particular tools or platforms, since the skills involved remain unclear (as in the ITU and PISA measures); also, people may use digital media without skills or, conversely, have critical skills which precisely lead them not to use certain media. In surveys, doubts arise regarding social desirability, with individuals over- or under-rating their skills depending on prevailing social norms. This poses particular difficulties in judging evidence of gender differences, since boys tend to claim better skills than girls, as revealed when self-report data are compared with direct observation (Hargittai & Shaffer, 2006).

The DiSTO project distils the digital skills required to achieve tangible beneficial outcomes in societies that rely on digital technologies (Van Deursen, Helsper & Eynon, 2014; Van Deursen, Helsper, & Eynon, 2016; Van Deursen & Helsper, 2017). It emphasises transferrable skills that are platform and application independent, thus measuring skills adaptable to rapidly changing digital environments. The measures have been refined through cognitive interviews, performance tests and internationally comparative scale validation with adult and youth populations (Livingstone, 2016; Van Deursen, Helsper & Eynon, 2016). They are assessed using a 5-point Likert scale that focuses on truth claims (Spitzberg, 2006) - 'Not at all true of me,' to 'Very true of me' - which invites a neutral and relatively objective response from participants, especially compared with scales that use evaluative or comparative terms (such as 'poor' or 'good' or 'expert') or dichotomous responses that ask respondents if they have a skill or not (Van Deursen, Helsper & Eynon, 2016).

To further reduce social desirability biases, each question can be answered by choosing the option, "I don't know what you mean by that" and, if prompted, the interviewer guides the respondent to ask themselves if these are skills they could demonstrate now, without help. It is encouraging that, when performance testing was undertaken following survey administration in the GKO Montenegro study, most children (between 82% and 97%, depending on the item) could demonstrate the skill they claimed in the survey, with few age or, importantly, gender differences (Logar et al., 2016). The approach described here has been developed for inclusion in population surveys but if greater accuracy in skills

assessment is required, direct performance tests may be preferred.

Table 1 shows the items developed in discussion between the DiSTO and GKO projects, with items phrased for the benefit of child respondents. The measure includes 24 items in the full version, 10 in the shorter, grouped according to the categories of operational, informational, social, creative and skills. This grouping, as well as the suggested choice of core items for the short version of the scale, is based on factor analyses conducted by the DiSTO project.

We are aware that other approaches exist, albeit focused on adults not children. Although the populations addressed are different, it is notable that prominent international approaches for measuring digital literacy focus on similar areas and dimensions, raising the possibility of common concepts and measurement. UNESCO's MIL framework strives for a holistic approach to media and information literacies to enable knowledge societies better to formulate policies, design professional standards and training programs, and empower the active participation of citizens (UNESCO, 2013).

In Table 2 we briefly compare the GKO approach with three current population-focused approaches for measuring media and information literacy in an effort to find common ground: MIL (UNESCO, 2013), and two frameworks promoted by the European Commission - DigComp (Vuorikari et al., 2016, see also Carretero, et al. 2017) and EAVI (European Commission, 2011). The comparison is inexact insofar as the GKO column documents the actual items used while the others summarize main topics, with many items behind them as part of lengthy questionnaires. The classifications also vary; for example, the European Association for Viewers' Interests (EAVI) distinguishes technical, cognitive, communicative and participatory skills (European Commission, 2011). The DigComp model, which is primarily concerned with labour market skills, identifies safety as an additional, cross-cutting competence, while the GKO model sees safety as dependent on all five skill areas and so not an independent skill, although a measure of safety can be constructed by combining particular items. Most striking, however, is the level of agreement across the different approaches regarding the areas of digital skills that should be measured. Since GKO is designed for children as young as nine, requiring that we attend to both the comprehensibility of the item and the overall length of the questionnaire (which has many objectives beyond skill measurement), single questions must stand in for an area of skills; hence the scale development and testing procedures were crucial.

Children's Digital Skills: Cross-national Findings

The Global Kids Online survey had, by late 2019, been conducted with 15,000 internet-using children in 11 countries across Europe, Africa, Southeast Asia and Latin America (Livingstone, Kardefelt Winther, & Hussein, 2019). For the most part, countries selected the core items plus some optional items from Table 1 (see www.globalkidsonline.net/survey for the full questionnaire). Here we report data for Chile (Cabello, et al., 2017), Bulgaria

(Kanchev et al., 2017), Montenegro (Logar et al., 2016) and South Africa (Phyfer et al., 2016); see Table 2. For further detail, we refer the reader to the national reports, which include the crucial finding that digital skills are higher for older than young people, age being the main factor differentiating among child internet users in each country.

Children report moderate to high levels of digital skill across the five categories but importantly levels vary by type. Social skills (which include a strong safety dimension) rank top in all countries, while creative skills are generally lowest. This might be because online social activities are key to children's everyday lives, they develop social skills at an early age. Information skills, on which children in most GKO countries score slightly lower, requires a broader understanding of the world (to know which information is true) in addition to understanding the practical usage of technology (which keywords to use for online searches), and so may develop later. Gender differences are not pronounced and they do not always favour boys. In Montenegro, boys report higher levels of competence in almost all skills but the differences are small, except as regards creating and posting their own music or video. In contrast, girls in Bulgaria report slightly higher levels of competence on most skills but the gender differences are again small. In Chile, girls also perform better in most skill areas, the exception being mobile skills. In South Africa the gender differences are also small and often mixed.

Country differences are hard to interpret without thorough contextualization but it is thought-provoking to find that South African children score highly on skills important for online safety – being able to change their privacy settings on social networking sites and to remove people from their contact lists. Skills linked to privacy and sharing personal information are somewhat lower in Chile, suggesting the need for e-safety training there. It is noteworthy that 45-60% of children are confident they can check if information they find online is true, although informational skills are generally lower in South Africa, and they could be improved everywhere. The ability to track costs of mobile use is lowest in Chile and South Africa, possibly because although mobile use is prominent in both countries it is often via a pre-paid plan, itself limiting in terms of online activities.

Implications for Research and Practice

Digital skills are a prerequisite for children to participate fairly in digital environments and enjoy the many opportunities the internet offers. We urge recognition of children as active citizens who deserve provision of educational and other resources that can enable them to develop the full range of skills needed. This is particularly important for younger children as they become internet users, often with fewer skills and lesser provision at school. While vulnerable children and marginalized groups also need support, our findings do not suggest that gender poses a particular problem as regards digital skills; indeed, it appears that, once girls and boys have gained access, their digital skills are fairly similar. This may be because access in lower income countries is concentrated among more educated parents who have

more gender-equal attitudes. However, attention to gender inequalities in relation to access and outcomes should remain a priority (Banaji, et al, 2018).

GKO data reveal the parts of each country where access to internet is lower and digital skills are weaker. This could be useful for piloting MIL Cities (UNESCO (2019)). For example, in Montenegro, 15 percent of children living in the poorest northern region do not use internet compared to 6 percent in the central and 7 percent in the southern regions. Therefore, working on MIL cities with the local authorities in the central and southern regions would be less challenging, while cooperation on the same initiative in the north would contribute to decreasing poverty.

The multidimensionality of our digital skills measure suggests that even when children develop the operational skills necessary for functional internet use, challenges remain in ensuring they have the critical, informational and creative skills for uses that bring tangible outcomes of value in their everyday lives (Helsper, 2017). Thus, structured support and guidance from their families and schools is vital. Crucially, now that children are faced with a constant flow of information from multiple sources, it is critical that their ability to distinguish high quality information from low quality information is strengthened. The finding that creative skills are least developed is a concern since it is children's right to express themselves and participate in the digital age, beyond receiving information provided by others, and these are skills children are less likely to develop independently. Finding ways to support children's creative skills and activities – especially using the mobile technologies that are often the main means of access for children in the global South – is a priority for policy and practice.

The approach and findings presented in this chapter are already stimulating initial interventions in the realm of policy and practice. For example, in Montenegro, research found that children are using the internet from a younger age, especially via smartphones, but that they lack strong digital skills and, as a result, many feel unsafe and unsupported as they go online. In response, UNICEF and Montenegro's Ministry of Education developed an educational role-play game, *NetFriends (NetPrijatelj)*, to build resilience against online violence. Available as a free smartphone app, the game has been widely promoted by celebrities and now a PC version is being developed for the primary school curriculum, with teaching resources to strengthen teachers', parents' and children's digital skills. As another example, GKO Argentina worked closely with their government to collect new data on children's digital skills; findings and insights from GKO played a role in drafting the government's first policy document and discussions are underway to include digital skills education in the school curriculum. In South Africa, data collected on inequalities in and barriers to access are informing the government's future research agenda on ICTs and children. In Chile, UNESCO and the Ministry of Education have supported the research from the outset, and are now exploring how to use the findings to benefit children's education.

While GKO offers a comprehensive battery of questions, it is unlikely to cover all possible skills that children need. Thus GKO will collaborate with relevant actors periodically to review and update the questionnaire to encompass new skills as they become relevant to children's well-being and future prospects. Future research should also examine how digital skills can translate – through government policy, educational curricula and parental knowledge - into positive and measurable outcomes for education, health, participation and other crucial dimensions of children's well-being.

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Table 1. Global Kids Online measures for digital skills

<p>Preamble: <i>Some people are good at doing things on the internet; other people find it a bit harder. I am going to ask you some questions about what you know how to do online. If you don't know what something is, don't worry, just say you don't know. If you don't know or don't want to answer any of the questions, just say so.</i></p>	
<p>Scale: <i>Think about how you use the internet. How true are these things for you? Choose one answer: Not true for me; A bit true for me; Fairly true for me; Very true for me; I don't know what you mean by that.</i></p>	
<p>Operational skills</p>	<p>1. I know how to save a photo that I find online 2. I know how to change my privacy settings (e.g., on a social networking site) 3. I know how to use a programming language (e.g., Python, C+ etc. <i>[add local examples]</i>) 4. I know how to open downloaded files 5. I know how to use shortcut keys (e.g., CTRL-C for copy, CTRL-S for save) 6. I know how to open a new tab in a browser</p>
<p>Information skills</p>	<p>7. I find it easy to check if the information I find online is true 8. I find it easy to choose the best keywords for online searches 9. I find it easy to find a website I have visited before 10. I find it easy to decide if a website can be trusted 11. Sometimes I end up on websites without knowing how I got there</p>
<p>Social skills</p>	<p>12. I know which information I should and shouldn't share online 13. I know how to remove people from my contact lists 14. I know when I should and shouldn't share information online 15. I know how to behave according to the situation online 16. I know how to change who I share content with (e.g., friends, friends of friends, everyone)</p>
<p>Creative skills</p>	<p>17. I know how to post online video or music that I have created myself 18. I know how to edit or make basic changes to online content that others have created 19. I know which different types of licences apply to online content 20. I know how to create something new from video or music that I found online 21. I know how to design a website</p>
<p>Mobile skills</p>	<p>22. I know how to install apps on a mobile device (e.g., phone or tablet) 23. I know how to keep track of the costs of mobile app use 24. I know how to make an in-app purchase</p>

Note: Adapted from Van Deursen et al. (2014), for use with children and/or parents. Bold items are proposed as core, others are optional.

Table 2. Comparison of approaches to media and information literacy and digital skills

Competence area	GKO	MIL	DigComp	EAVI
Operational skills		Access		Access
	Save a photo	Store and retrieve	Manage data	Organize
	Use a programming language		Use programming languages	
	Open downloaded files		Manage data	
	Use shortcut keys			
	Open new tabs			
			Solve technical problems	Critical awareness of technical issues
	Change privacy settings		Personal data and privacy; Solve problems	
Information skills		Understand	Information and data literacy	
		Articulate information needs	Articulate information needs	
	Check if information is true	Analyze, compare, and apply	Evaluate data and content	Compare and contrast
	Choose best keywords for search	Search	Browse, search and filter data and content	Search
	Find a website visited before		Manage data and content	
	Decide which information to trust	Assess and evaluate	Evaluate data and content	Evaluate
	[Avoid] unexpected visits to websites		Identify personal competence gaps	
Social skills		Communicate	Communicate and collaborate	Maintain contact
	Manage who to		Share; Personal	

	share with		data and privacy	
	Know when to share/not share		Netiquette	Participate in groups
	Remove contacts		Solve problems	Manage contacts
			Collaborate	Collaborate
	Know to behave appropriately	Engage in citizenship	Netiquette	Engage in citizenship
	Know which information to share/not share	Appropriate identity presentation	Share; Netiquette	
Creative skills	Post video or music that the user has created her/himself	Create in an ethical manner	Create content; share information	Create
	Edit online content that others have created		Re-elaborate content	
	Create something new from video or music found online		Re-elaborate content	
	Design a website		Content creation	
	Understand content licences		Copyright and licences	Understand media regulation
		Synthesize		Synthesize
		Monitor		
Mobile skills	Install apps		Identify needs; Solve problems	
	Track app costs			
	Make in-app purchase			
In addition: Safety	Items above on operational, information, social, creative and mobile skills are concerned with safety		Protect devices	
			Protect personal data and privacy	

			Protect health and well-being	
			Protect the environment	

Table 3. Global Kids Online findings for digital skills of children, by gender and country

Percentage who said “fairly” or “very true” of me (that “I know how to...”, numbered by items shown in Table 1)		Bulgaria			Chile			Montenegro			South Africa		
		Al l (%)	Gir ls (%)	Bo ys (%)	Al l (%)	Gir ls (%)	Bo ys (%)	Al l (%)	Gir ls (%)	Bo ys (%)	Al l (%)	Gir ls (%)	Bo ys (%)
Operational skills	Save a photo (1)	86	89	84	67	72	61	79	78	80	81	83	78
	Change privacy (2)	73	74	72	51	55	48	66	64	67	73	74	71
Information skills	Check information (7)	52	52	53	57	59	56	60	56	62	45	47	44
	Choose keywords (8)	76	80	77	67	69	66	84	83	84	47	44	50
Social skills	Know what to share (12)	82	84	80	67	68	67	86	85	86	73	74	72
	Remove contacts (13)	83	84	82	74	80	69	80	80	80	84	83	84
Creative skills	Create + post content (17)	80	72	71	36	37	36	48	42	54	41	37	45
	Design a website	44	45	43	n/a	n/a	n/a	34	32	36	24	n/a	n/a

	(21)												
Mobile skills	Install apps (22)	77	77	77	84	81	86	80	78	81	60	54	66
	Track costs (23)	67	66	67	33	30	35	64	62	67	40	34	46
<i>Bases (of internet users aged 9-17 years old)</i>		<i>N=1000</i>			<i>N=1000</i>			<i>N=1002</i>			<i>N=643</i>		