How do digital competence frameworks address the digital divide?

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Introduction

Digital competence frameworks define the component knowledge, skills and attitudes to achieve different levels of digital competence/literacy. UNESCO-UNEVOC's repository of these frameworks brings them together in a single place. The repository contains more than 30 frameworks from over 20 countries. The repository provides an opportunity to examine how policy-makers, educationalists and labour market organizations are addressing inclusion within the frameworks. If these frameworks are to benefit all groups in society, they have to confront the risk of introducing new, and reinforcing entrenched, inequalities that characterize the digital skills field. As information technology has increased its reach and importance across all aspects of our lives over the last four decades so it has brought with it new forms of inequality or 'digital divides'. These 'digital divides' are multi-dimensional and some argue increasing. This article will examine what these divides look like and assess the extent to which the digital competence frameworks recognize and attempt to adapt to such divides.

Understanding digital divides

The pandemic shone a light on the differences that exist in access to digital technology across the world. A third of the world's population do not use the internet - some approximately 3 billion people mainly located in Africa and south-east Asia.[1] Many of these are women. In Iraq, 98% of men can connect to the internet, but only 53% of women are able to.[2] Differences in access to digital technology exist in the global north as well the global south. In the USA, approximately a quarter (24%) of adults with household incomes below $30,000 a year don't own a smartphone while nearly everyone earning over $100,000 does.[3] Whilst in Europe, 77.9% of rural households and 87.9% of urban households had access to the Internet in 2019.[4] The evidence shows that 'digital divides' exist across the world. Understanding what drives them and their nature however requires analysis to deconstruct what digital divides mean.

To some researchers the term 'digital divide' is problematic. Van Dijk (2005)[5] argues it suggests a simple divide between two groups – one of whom is included with the other excluded. The term also implies an absolute divide with a form of technological determinism where inequalities in access can be solved by improving one, single factor such as physical access. The reality is more complex, for example, while a third of the world's population may not use the internet, this does not imply they are entirely divorced from digital technology. Inequalities in access to digital technology are both multiple and relative with some form of engagement the norm amongst whole populations. It is important therefore to

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[1] https://datareportal.com/global-digital-overview

[2] Wilcox, O. (2021) Visualizing the Global Digital Divide, DT Global 4th March 2021 - https://dt-global.com/company/blog/march-4th-2021/visualizing-digital-divide

[3] Vogels, E. (2021) Digital divide persists even as Americans with lower incomes make gains in tech adoption, Pew Research Center, 22nd June 2021 - https://www.pewresearch.org/fact-tank/2021/06/22/digital-divide-persists-even-as-americans-with-lower-incomes-make-gains-in-tech-adoption/

[4] ITU (2020) Measuring digital development Facts and figures 2020 - https://www.unapcict.org/sites/default/files/2021-03/FactsFigures2020.pdf

[5] Van Dijk, J.A.G.M. (2005). The deepening divide: Inequality in the information society. London: Sage Publications.

speak of digital divides in the plural to recognize the varying forms that differences in access to digital technology takes. It also needs to be recognized that what constitutes inclusion/exclusion is not static but evolves over time, changing as technology develops.

To better understand how digital divides manifest themselves, Van Dijk constructed a schema based around different phases in the process of access to digital technology. This schema, although nearly 20 years old, remains a useful and valid tool. Van Dijk cites the digital divide to be: *a division between people who have access and use of digital media and those who do not[6]*. He presented a theoretical schema for analysing access to digital technology made up of four phases:

- Phase 1: Motivation, attitude, intention and social support

- Phase 2: Physical access

- Phase 3: Skills access

- Phase 4: Usage access

In this schema, motivation comes before physical access, i.e. access to hardware, software, data/internet. This is a straightforward but important insight. Given the extent to which digital technology dominates social and economic life, it could be assumed that all social groups want to access particular technologies in the same way. Hence if they can be provided with hardware, data, etc., then any digital divides can be resolved. However, the use of digital technologies is shaped by the structural and cultural context within which the individual or community sits.

Van Dijk placed a strong emphasis on the key role these broader social inequalities play in shaping digital divides. They shape all the four phases in his schema, but especially the first one. Differences in motivation to engage with specific aspects of digital life are not driven primarily by lack of interest or a deficit in the personal capacities of particular groups but reflect their position within unequal societies. For example, the evidence shows that those from lower socio-economic backgrounds are less likely to participate in online learning[7]. This is not because they do not care about the level of knowledge or skills they have, rather it reflects a combination of an antithesis to learning based on their experiences in compulsory education; less relevance and obvious benefit to such learning in the labour market compared to other better qualified workers, and less flexibility from employers to enable them to participate in learning. It is a function of their socio-economic position and context rather than their personal proclivities.

Van Dijk's second phase: physical access can also reflect socio-economic inequalities. An individual's ability to access software and devices is directly linked to their own or their family's income as well as the availability, quality and price of local internet and data services. Again, these factors are in flux as new technologies and software emerges, risking the reinforcement of existing and the creation of new divides. As new (expensive) technology emerges, physical inequalities in access to digital technology may be perpetuated. A good example here is access to online communication platforms. Through the COVID-19 pandemic, such platforms became a ubiquitous method of communication and are now a permanent feature of work practices. But while a one-hour Zoom video call using mobile data in the US costs around $4; in Benin and Malawi that same Zoom call would cost $14 – which is equivalent to the average weekly salary in Malawi.[8]

Van Dijk's third phase is having sufficient and adequate digital skills or literacy to utilize digital technology (phase 4). Van Dijk categorized six skills: two medium-related skills (i) operational (technical skills to command digital media) and (ii) formal skills (browsing and navigating on the web) and four content-related skills: (iii) information skills (the ability to search, select and evaluate information in digital media); (iv) communication skills (the ability to communicate on the internet); (v) content creation skills (the ability to generate content) and (vi) strategic skills (using a digital medium for a particular personal or professional goal)[9]. This is where the definition and application of digital competence frameworks come in. As with contextual constraints on physical digital access, the skills required for digital engagement are evolving and differ across contexts. Digital competence frameworks are an attempt to define the skills necessary to use digital technology but their effectiveness in doing this is related to the extent they take into account the issues raised in the first two elements of this schema. Frameworks that assume all potential users enter wanting the same thing from them, are couched in technical language that does not relate to the lives of the user or are predicated on access data/software

[6] Van Dijk (2020), The Digital Divide, Cambridge, United Kingdom: Polity Press, UK p1

[7] Hansen J. D et al. (2015) Democratizing education? Examining access and usage patterns in massive open online courses, Science Vol 350, Issue 6265 pp. 1245-1248

[8] Wilcox (2021), ibid

[9] van Dijk and van Deursen (2014), *Digital Skills Unlocking the Information Society,* New York: Palgrave MacMillan:

which is not universally available will not in practice be able to address this digital divide.

The final phase of access is what Van Dijk describes as 'the primary goal – usage'. This can be measured as (i) usage time and frequency, (ii) number and diversity of usage applications, (iii) (with networks) broadband or narrowband use and (iv) more or less active or creative use. The priority here is understanding what usage means for different groups and the needs or benefits they derive from such usage. Where digital competency frameworks are concerned, this implies understanding who is using them, why and what for. This requires not just monitoring information on numbers of users and their characteristics but more in-depth data on how a digital competence framework may be benefiting them in the personal and working lives.

Do digital competence frameworks address digital divides?

In order to maximize their effectiveness, digital competency frameworks need to be structured in terms of both design and delivery to reflect social divisions. This section examines the extent to which the frameworks included in the UNESCO-UNEVOC repository display an awareness of the existence of the digital divides described above and whether there are specific elements of them which cover this issue.

Of the frameworks included in the new UNESCO-UNEVOC repository, just over half (52%) mentioned differences in access to digital technology. Of the frameworks that did mention issues of access, the majority discussed the importance of their framework being available to those from different socio-economic backgrounds, ethnic groups or those with disabilities. Some included specific content focused on access to digital technology. Four of those frameworks are examined below. Two of the frameworks are international in scope and two are from specific countries. They are selected to illustrate different ways in which digital competency frameworks are addressing the issue of inequities in access to digital technology.

The DigCompEdu framework was developed by the European Commission in 2017 for educators at all levels of education, from early childhood to higher and adult education.[10] It is structured around a set of six thematic areas – one of which is 'Empowering Learners'. Within this thematic area there are three sections, one of which is 'Accessibility and Inclusion'. One of the activities listed in this section is '*to select and employ digital pedagogical strategies which respond to learners' digital context, e.g. contextual constraints to their technology use (e.g. availability), competences, expectations, attitudes, misconceptions and misuses.*' It also includes as one of the proficiency statements '*I understand how access to digital technology creates divides and how students' social and economic conditions have an impact on the way technology is used*'. Such recognition of differences in access to digital technology in the framework is welcome but Accessibility and Inclusion is one of 22 competency areas. It is not a central concern that shapes how the framework is presented or to be implemented.

The Digital Teaching Professional Framework was launched in the UK in 2019 by the Education and Training Foundation and is aimed at organizations providing TVET education and also educators in the TVET field. It includes six different elements including 'Accessibility and Inclusion'. One of the activities is described as *'Provide equitable access to appropriate digital technologies and resources, e.g. ensuring that all learners have access to the digital technologies used'.* There is also a recognition that thinking about physical access is not enough as another of the activities considers motivation, attitude, intention and social support – '*select and use digital strategies which respond to the learner's digital context, e.g. contextual constraints to their technology use competences, expectations, attitudes, misconceptions and misuses.*'[11] This activity corresponds closely to phase 1 of Van Dijk's access to digital technology schema described above.

Work by UNESCO has included examining the possibility of using digital competence frameworks as the basis to **measure** digital skills acquisition and access. The UNESCO '*Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2'* uses the work of the European Commission in developing a digital framework for citizens i.e. DigComp 2.0 to measure progress towards achieving Sustainable Development Goal (SDG) Indicator 4.4.2: "*Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills*".[12] Of all the frameworks in the online repository, it is the one that places the greatest emphasis on addressing inequality. The framework is developed with reference to DigiComp 2.0 but also on extensive mapping of digital literacy frameworks in 47 countries

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[10] To see the framework please go to: https://publications.jrc.ec.europa.eu/repository/handle/JRC107466

[11] To see the framework please go to: https://www.et-foundation.co.uk/professional-development/edtech-support/digital-skills-competency-framework/#:~:text=The%20Digital%20Teaching%20Professional%20Framework,workplace%2C%20community%20settings%20and%20prisons.

[12] To see the framework please go to: http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf

and consultation with experts across the world. It includes the five digital competence areas in DigComp 2.0: Information and data literacy; Communication and collaboration; Digital content creation; Safety; and Problem solving and adds two additional competence areas. In particular, a competence level 0 is added to 'Devices and software operations', specifically to recognize that some of those in lower income countries may need support in identifying how to use hardware and software at a basic level. One of the strengths of the framework is that the activities for learners suggested within it are framed with developing country contexts in mind as they can be done using smartphones, which is how most of the populations in such countries access the internet rather than via laptops/personal computers.

The Foundation Skills for Your Future Digital Framework produced by the Australian government aims to support a broader programme offering subsidized training to support individuals to identify language, literacy, numeracy and digital (LLND) skill needs and enables eligible participants to access either accredited or non-accredited training either in a traditional vocational education and training (VET) or workplace setting. Details regarding how the framework was developed have been published including its theoretical underpinnings. In these underpinnings, there is an explicit recognition that digital divides are multi-faceted and for people with low literacy and numeracy levels, low-income earners, indigenous learners and many learners from diverse backgrounds, they may have issues in accessing digital technology.

Looking at the frameworks overall within the repository, the use of commercially produced enterprise frameworks such at the International Computer Driving License (ICDL), may have implications for access to digital technology. The research undertaken to inform the development of the UNESCO '*Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2*', highlighted the prevalence of the commercial enterprise frameworks in Latin American, Africa and Asia. They found that 36 of the 47 sampled countries have adopted commercial enterprise frameworks. There is a strong efficiency argument for adopting these existing, well-established frameworks rather than investing in new ones. However, it is difficult to then mould these frameworks to meet the needs of different populations, many of whom are in low-income situations and experiencing multiple obstacles to digital access and education, social and labour market exclusion.

The extent to which digital competence frameworks are overcoming digital divides at this point is hard to establish – as there is a lack of publicly available data on who is using them. The majority of the frameworks have been developed in the last 5 years, so this is not surprising but collecting and publishing data on who is using them, including their background characteristics, is crucial. Such data will illustrate the extent to which recognizing digital divides in the development of the framework, as the Foundation Skills for Your Future framework does for example, then shapes the profile of users or identifies whether there are other factors at play in shaping usage. It is also important to consult with users/beneficiaries to understand what their digital skill needs are. The introduction of digital competence frameworks may be creating new barriers to those from marginalized groups if they are perceived as representing another obstacle to entering the labour market and employment rather than being an enabling force which can offer new opportunities to such groups. As Van Dijk argued above, the content of the frameworks and their assessment methods may not recognize how digital technology is used in all contexts. For example, content may be predicated on formal work settings, thus favouring those in employment as opposed to informal, community related settings. Only by engaging users with different backgrounds and characteristics in the design of frameworks will such issues be identified and addressed.

These reflect the 4As[13] of inclusion recently discussed in a UNESCO-UNEVOC report. These are:

1. Availability = are the needs of differentiated groups being addressed in digital competence frameworks and digital strategies?

2. Adaptability = is the curriculum to deliver digital skills and the pedagogy appropriate to meet intersectional needs of all groups?

3. Acceptability = are representative groups involved in defining digital competence frameworks and do any adjustments and provisions for inclusion undermine the perception of them?

4. Accessibility = are there provisions to include **all** groups with their differentiated need in terms of physical and digital infrastructures and equipment and can teachers utilize them for the benefit of all learners?

Overall, it is encouraging to see that most of the frameworks recognisze the existence of digital divides. However, given their importance in shaping engagement with digital technology, they could feature inclusion more prominently. Only in the minority of frameworks do considerations regarding inclusion form part of the framework itself and in those cases a minor part.

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[13] Adapted from UNESCO-UNEVOC (2021), Technical and vocational education and training for disadvantaged youth (see: tvet_for_disadvantaged_youth.pdf (unesco.org)

Addressing digital divides – the role of competence frameworks

Digital divides are part of a bigger picture where inequality is concerned. They are rooted in historic social and economic divides based around differences in power and resources. There are limits to which digital competence frameworks can address such divides. However, the fact remains that access and inclusion are a low priority where existing digital competence frameworks are concerned. To develop digital competence frameworks with a greater appreciation of digital divides, there are two different ways forward here.

One option is to develop bespoke strategies and frameworks aimed specifically at those from groups affected by the digital divides described. It is argued that a 'one size fits all' strategy to addressdigital divides, such as that embodied in the majority of existing frameworks, is unable to meet the distinct needs of different groups.[14] As Lyons et al (2019) argue when looking at addressing digital divides for the G20 summit in Japan in 2019, *'Developing content that is adapted to different needs and capabilities is essential to facilitating the learning process and enhancing learners' interest and motivation in using digital technologies'.* Frameworks that are designed around the needs of particular groups with content that is culturally sensitive, is in the native language of the target population and relates to their lived experiences is the most likely way to enhance the digital competence of those on the wrong side of the digital divides. However, it is also the most expensive and would add to the proliferation of digital competence frameworks.

An alternative approach is more direct recognition of the different needs of those impacted by digital divides in the construction of broader, generic frameworks such as those described in the UNESCO-UNEVOC online repository. There are several ways this could be done – highlighting the different groups whom the framework is aimed at more explicitly and openly acknowledging that some may need more support in accessing the framework, including an array of activities that could be undertaken on a wider range of devices and most importantly engaging with different groups in the design and implementation phase of the frameworks. Overarching frameworks in a country or across a professional sector will continue to be the most efficient way of enhancing competence. But potentially there is much to explore to make them applicable to as many groups as possible.

Whether developing bespoke or more generic frameworks, it is essential that they fit with broader education/training strategies that themselves look to address inequalities in the acquisition of both digital and non-digital education and skills. In 2023, the UNESCO-UNEVOC repository will expand its hub of information to include national and international digital skills strategies. This repository will be a source of information on the extent to which broader digital skills strategies reflect digital divides or not. As the UNESCO-UNEVOC hub on digitalization in TVET develops in the coming years, these issues will be further discussed.

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[14] Lyons, A.C., Zucchetti, A.,Kass-Hanna, J., Cobo, C. (2019) Bridging the Gap Between Digital Skills and Employability for Vulnerable Populations, G20 2019 Japan - https://www.g20-insights.org/policy_briefs/bridging-the-gap-between-digital-skills-and-employability-for-vulnerable-populations/

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