Bridging the Digital Divide – Measuring Digital Literacy

Response to the peer reviewer

1. Developing the Digital Literacy Index

The intention of the paper is not to provide a composite measurement of digital literacy, using an index but to rather provide guidance in how such an index could be constructed. Currently, there is no internationally comparable data, representative of the online and offline populations, which can be used to quantify the multidimensional nature of a digital literacy index. Thus, it is only possible to describe the outline of such an index. We argue that a body such as the G20 will need to consider the current data limitations and construct an index in line with the suggested digital literacy framework. Therefore, the central argument of the paper is that gathering data in a representative manner can be used to construct an international comparable digital literacy index. This index can then be used as a tool by G20 policy makers to better understand a country's position in the international context. If this argument is not presented clearly, then it can be refined further.

2. Systematic Review

The systematic literature review approach was the first approach taken to identifyi relevant studies which informed the outline of our digital literacy framework. Due to space limitations, we abbreviated the methodology section of the paper and dedicated more space to the findings.

The first step taken during the literature review, was to perform a keyword and title search for journal articles across academic databases. The keywords used were "digital literacy" & "definition" The additional search criteria was to limit studies between 2005 and 2016 and only include online journal article. The results per database were:

Database	Article Count
OneFile (GALE)	18
ABI/INFORM Complete	8
ABI/INFORM Global	7
Taylor & Francis Online - Journals	4
ERIC (U.S. Dept. of Education)	4
SAGE Journals	4
Agricultural & Environmental Science Database	3
SpringerLink	3
ABI/INFORM Dateline	1
JSTOR Current Journals	3
Directory of Open Access Journals (DOAJ)	2
Emerald Insight	1

Literature Resource Center (Gale)	1
Medline/Pubmed (NLM)	2
ScienceDirect Journals (Elsevier)	2
Oxford Journals (Oxford University Press)	1
	64

Digital literacy itself was a popular topic, with over 59,000 articles emerging. Our interest however was to focus on studies which attempted to define digital literacy. Ultimately, we found 64 possible studies, but on closer review of the studies abstracts, only a few of the papers were useful, as the context of the study was not appropriate or the paper only narrowly defined a component of digital literacy.

Considering this challenge, the second phase of the literature review involved reviewing studies produced by international bodies between 2010 and 2016. The goal was to identify how other bodies recognise the challenges digital literacy and to further review the studies which led them to their conclusions. Following this approach, it was noted that different organisations refer to digital literacies by different names and had different definitions behind their terms, with some commonalities. The organisations identified include UNESCO, OECD, WEF and the Chinese Internet Network Information Centre. From this combination of approaches, the key studies that were identified were produced by OECD (2016), SCONUL Working Group on Information Literacy (2011), McKinsey & Company (2014), Pirzada and Khan (2013), Ridsdale et al. (2015), the UNESCO (2011), Martin (2008), Covello (2010) and Bawden (2008).

3. The development of the digital literacy framework

Section 4.3 summarises the various studies reviewed which identify the components of digital literacy framework. Due to space limitations for the article, it was not practical to identify and contrast the definitions adopted by each author. The approach taken was to present the commonalities expressed by the authors who described the sub-components to digital literacy. Amongst the authors that attempted to describe digital literacy in this manner, each alluded to the multitude of skills required in the field. The idea of complementarity surfaced regularly, whereby one set of skills could serve an individual well if applied within a different context. The differences in definitions generally related to terms that were used but had a different meaning in the context. For example, computer literacy and technology literacy are sometimes misrepresented. Some studies used technology literacy to refer to hardware and software usage and knowledge. For the purpose of this study, it was necessary to separate these terms, due to their differing meanings.

The key take-away message here for policy makers, is when adopting a definition of digital literacy, they must ensure they have clear definitions of each sub-component. Our 2nd paper submitted to this journal, titled “Bridging the digital divide in the G20: skills for the new age” referred to a possible approach to determine what digital skills are valued by employers. Through the extraction of data from job advertisement websites, it is possible to regularly poll the market for the most common skills and tools required by employers, as stated within their advertisement. If such an approach is adopted by central G20 agency, the definition of digital literacy could be adapted based on the most urgent needs of employers. As authors of this study, we advise that the definition could be initially framed in terms of the currently

identified dimensions emergent from the literature, but future revisions to the definition will differ as the digital skills market evolves over time.

4. Multi-disciplinary vs multidimensional

In the paper we choose to distinguish between disciplines and dimensions. A discipline is a branch of knowledge whilst a dimension, in the context of an index, refers to a measurable sub-component of the index. Thus, when describing the multiple facets of digital literacy, it is done so whilst referring to the varied fields of knowledge relevant to the broad concept of digital literacy. We prefer to use the term dimension, when describing the sub-components to an index. Considering the content that is described (skills related digital literacy and the measurement of these sets of skills), an argument could be made that these terms could be used interchangeably.

5. Agile approach to the definition of digital literacy

The Agile definition that is referred to, is based on the Agile methodology, usually adopted within a software development environment. As discussed in the Agile Handbook[1], the methodology can be applied in any field. The approach involves dividing a project in manageable chunks and thereafter at regular intervals, fine tune the end-product. In this instance, the end-product is the initial agreed definition of digital literacy. Thereafter, it is necessary to update the definition based on the changing digital literacy landscape. The only means to reassess the 'landscape' is to introduce structures and processes that will allow a formal body, dedicated to defining and refining digital literacy, to firstly refine the digital literacy definition and thereafter refine the data gathering instrument in line with the revised digital literacy definition.

There is a danger in adopting a static definition of digital literacy, static data collection strategies and static policies informed by an outdated digital literacy definition. As technology advances rapidly, policies pertaining to the rollout of training programmes must also be revised accordingly, in line with the changing 'landscape.' Revising policy is a notoriously slow process, thus understanding how rapidly such changes occur in the market is crucial.

An agile definition of digital literacy will only fail, if there are multiple definitions adopted across the G20. It is the argument of this paper, that there should be a single governing structure which adopts a shared centralised definition of digital literacy. Thereafter, based on this centralised but evolving definition, a data collection instrument is devised, which is administered across G20 nations. If each country adopts their own evolving definitions of digital literacy, the results will not be comparable and therefore the group will struggle to assess their collective efforts to address this challenge and will be not be able to position the performance of their efforts in the context of the G20.

[1] p5 http://agilehandbook.com/agile-handbook.pdf

6. Benefits of measuring digital literacy (pp 4.4.)

Section 4.4. discusses the merits of measuring digital literacy in the context of the G20 countries. Ultimately the concepts of digital literacy measurement ring true for the G20 as they do in any other country, largely due to the novelty of concept itself. The arguments that are put forward, are to assist G20 policy makers in understanding the rationale for measuring digital literacy and how a disaggregated digital literacy measurement could help direct resources to the areas of most need. In absence of such a measurement, there is no evidence to assist policy makers and relevant government agencies in the manner they introduce programmes to respond to the changing demands of employers.

Such an approach is used currently by policy makers when addressing challenges of traditional literacy, through the PIRLS assessment, and could have similar benefits in addressing the digital literacy challenges affecting G20 countries.

7. Editing

We will be guided by the journal editors if there is a need for further revisions/edits to the paper.