Digital Inclusion

International Policy and Research

Edited by
Simeon Yates · Elinor Carmi
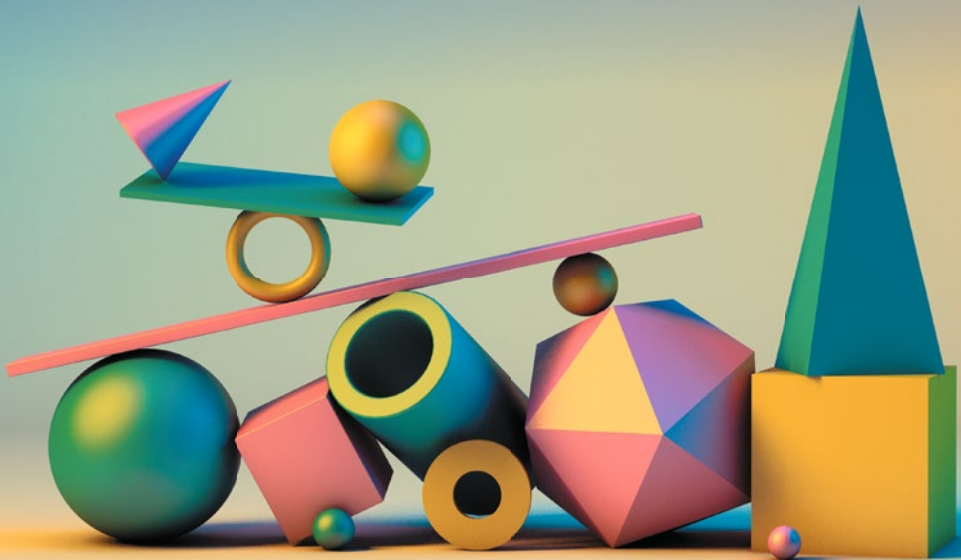
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Palgrave Studies in Digital Inequalities

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Power, exclusion, and the widening gaps between those with agency and those without is the foremost question of our time among scholars across humanities and the social sciences. This series speaks to the main drivers of power and exclusion in contemporary society: digital technological advances that are rapidly transforming society. Titles in this series will investigate and propose different ways to think, analyse and understand inequalities in the digital age. Themes covered include, but are not limited to, how digital inequalities persist vis-à-vis economic class, gender, sexuality, race and ethnicity, aging, disability, healthcare, education, rural residency, networks, and global geographies, as well as the study of emergent forms of inequality related to AI, digital labor, the platform economy and networked individualism, cybersafety, cybercrime, gaming, and emotional well-being.

Our goal is to create a series at the centre of these debates, pushing the field forward. Thematically, the series will examine both problems and solutions. On the one hand, we welcome monographs that map out how diverse digital technologies are exacerbating inequalities or creating new ones. On the other hand, we also welcome monographs that chart out how these technologies can be used to tackle social exclusions and marginalization.

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Michael Dezuanni undertakes research about digital media, literacies, and learning in home, school, and community contexts. He is the Program Leader for Digital Inclusion and Participation for Queensland University of Technology's (QUT's) Digital Media Research Centre which produces world-leading research for a creative, inclusive, and fair digital media environment. He is also a chief investigator in the Australian Research Council (ARC) Centre of Excellence for the Digital Child. Dezuanni has been a chief investigator on six ARC Linkage projects with a focus on digital literacy and learning at school, the use of digital games in the classroom, digital inclusion in regional and rural Australia and in low-income families, and the use of screen content in formal and informal learning. He is the author of *Peer Pedagogies on Digital Platforms—Learning with Minecraft Let's Play Videos* (2020).

Daniel Featherstone is a senior research fellow within the ARC Centre of Excellence for Automated Decision-Making and Society, based at RMIT University in Melbourne. He leads the four-year 'Mapping the Digital Gap' research project on digital inclusion in remote First Nations communities. Daniel was previously the general manager of national peak

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Anna Feigenbaum is a Professor of Digital Storytelling at Bournemouth University where she co-directs the Centre for Science, Health and Data Communication. She is the author of *The Data Storytelling Workbook* (2020) and has published widely in the fields of data communications, technology, and education. She is a regular contributor to national and international media and is a digital and data literacy consultant and trainer. In 2020–2021 she was the PI on the UKRI/AHRC COVID-19 Rapid Response grant 'Comics in the Time of COVID-19'.

Indigo Holcombe-James is ACMI's Strategic Research Lead, where she coordinates and conducts audience research that ensures visitors are at the heart of your museum of screen culture. Previously, Indigo was a Research Fellow in the ARC Centre of Excellence for Automated Decision-Making and Society, where she investigated digital inequality and transformation in the creative and cultural industries. Indigo's research has been published in *Cultural Trends, Archival Science, Cultural Studies* and the *International Journal of Communication*.

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Amber Marshall is a Lecturer in Management in the Griffith Business School at Griffith University. Her research focuses on digital inclusion in rural and agricultural contexts. She has expertise and experience in qualitative research methods and policy analysis.

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Aaron Slater is the Digital Inclusion Manager at the Scottish Council for Voluntary Organisations (SCVO). His role involves supporting organisations across Scotland to embed digital inclusion in frontline service delivery. He has also been involved in the design and delivery of the Scottish Government's 'Connecting Scotland' programme and is a member of the Digital Poverty Alliance Community Board. His previous work has included thematic projects on digital inclusion in social housing, workforce skills in local government, and the UK-wide One Digital programme.

Ozlem Demirkol Tonnesen is a Postdoctoral Researcher at the University of Bergen researching immigrants mediated public connection in their datafied everyday lives. She completed her PhD at the University of Southampton, which explored the use of Twitter by microcelebrity accounts dissenting against the Turkish government during the 2018 Turkish Elections. She has collaborated with academics and NGOs on several research projects that explored personalisation, health communication and community building on a variety of social media platforms. She also served as the elected Graduate Student Representative for the Association of Internet Researchers between 2021–2023.

Josef Trappel is Professor of Media Policy and Media Economics and the head of the Department for Communication Studies at the University of Salzburg, Austria. His research concentrates on media and democracy, changes in media structures and their implications on mass communication, digitisation and innovation, national and international media policy and media economics. He is the Euromedia Research Group convenor and Director of the EU Erasmus+ Joint Master Programme "Digital Communication Leadership". Latest publication: *Success and Failure in News Media Performance. Comparative Analysis in The Media for Democracy Monitor* (Nordicom, 2022).

Leo Van Audenhove is a professor and head of the Department of Communication Studies of Vrije Universiteit Brussel. He is a researcher at the same university's iMEC-SMIT—Studies on Media, Innovation and Technology. He is an extraordinary professor at the University of the Western Cape. In 2013, he was instrumental in setting up the Knowledge Centre for Digital and Media Literacy in Flanders, of which he subsequently became the director. The centre was established as an independent centre to promote digital and media literacy in Flanders by the government. His research focuses on media and data literacy, digital inclusion and ICT4D.

Irene Warner-Mackintosh is Managing Director with Mhor Collective, a community interest company which works in partnership with agencies across the third sector to address digital inequality. She gained her PhD at the University of the West of Scotland, researching the impact of digital inequality on people facing multiple social exclusions, and exploring the concept of digital capital.

Simeon Yates is Professor of Digital Culture in the Department of Communications and Media at the University of Liverpool and Joint Director of the Digital Media and Society Research Institute. He has undertaken research on the social, political, and cultural impacts of digital media for over three decades. A major focus has been on projects that address issues of digital inclusion and exclusion. He is working with both academic and government colleagues to develop policy and interventions to support digital inclusion. This includes working with the UK's Department of Digital, Culture, Media, and Sport (DCMS), the UK's media regulator Ofcom, and the Welsh Government—as well as charity organisations such as the Good Things Foundation, Cwmpas in Wales, and SCVO in Scotland.

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CHAPTER 1

Introduction

Simeon Yates and Elinor Carmi

1 Digital Inclusion, Digital Literacies, and Digital Participation

This book developed from the "Digital Inclusion Policy and Research Conference 2021". This was the third in a series of conferences that brought together, academic researchers, policy makers and practitioners. The chapters presented here represent the breadth of topics explored at the conference. The conference took place – online – at the height of the COVID-19 pandemic and as a result several the chapters here explore issues that arose or interventions that took place in response to COVID-19. This is not just a curiosity of timing but reflects a key shift in thinking, especially policy, thinking about digital exclusion and strategies for digital inclusion. COVID-19 lockdowns drove a range of responses. Many governments their agencies, health providers, community groups and businesses shifted "online". There were many potential benefits with this shift – but it also left a lot of people behind. In fact, from our own

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experience and discussions with governments and civic stakeholders, we can confidently say that levels of digital inequality – not just absolute digital exclusion – caught many organisations off guard. Levels of digital access (e.g., broadband speeds), equipment, spaces in the home to use digital kit, distribution across families, as well as individual and household digital literacies were all found to be wanting or much lower than assumed. Suddenly one laptop and tablet were not enough for a single parent with two school age children under lock down. Only having an older smart phone was massively problematic for a young adult in lockdown. Medical services going online became hard to access for older adults dependent on relatives to access and use digital technologies.

In this volume we have a range of chapters focused on research, evaluation, and the description of digital inclusion interventions. They cover countries and communities across the globe. Many cover or reference responses in relation to COVID-19, others address broader policy issues or specific case studies. Given these cross-cutting themes across all the chapters giving the overall book a simple structure was a challenge. We have therefore placed chapters in three sections:

1. Policy and place: Policy interventions at a national scale
2. COVID-19: Responses to and the impact of COVID-19
3. Digital literacy: Creativity, civic participation, and capabilities

2   POLICY AND PLACE: POLICY INTERVENTIONS AT A NATIONAL SCALE

Part I presents three chapters that look at national digital inclusion policies at different scales – from comparison across different interventions in Australia, to comparisons across South American nations, on to an in-depth examination of a single national programme in Scotland. This section begins with Daniel Featherstone's review of the impact of telecommunications infrastructure programs on internet access in Australia's remote Indigenous communities. Though not focused on COVID-19 the review took place shortly after the start of the pandemic. Featherstone reviews five years and 155 million Australian Dollars (£90 million UK pounds; $110 US dollars) of investments. Despite this investment Featherstone finds that significant gaps in access and usage of communications technologies remained for Australia's remote Indigenous

communities. These gaps remain due to issues of affordability, lack of last mile delivery or community access facilities, service quality and congestion, and barriers to using online services. Featherstone finds that some communities have chosen to not accept infrastructure due to concerns around cyber-safety, potential impacts on cultural and social cohesion, and ongoing costs of services and maintenance. He therefore concludes that without a coordinated digital inclusion strategy in place to address these barriers, there is currently a patchwork of solutions. Featherstone concludes the chapter by noting subsequent policy efforts to address the growing digital divide for First Nations people in Australia, including the establishment of a target to close the digital inclusion gap.

Bernadette Califano and Martín Becerra analyse policy interventions to address digital inequalities in five different Latin American countries: Argentina, Brazil, Chile, Colombia, and Mexico. They focus on the first months after the outbreak of COVID-19 reached the region in March–June 2020. They argue that Latin American governments responded quickly to the spike in demand for connectivity posed by the pandemic. Califano and Becerra argue this response was possible because of two factors. First, these countries had learned from what had happened in other areas of the world as the pandemic took hold. Second, the response was partly based on the legacy of public policies resulting from previous experiences in the sector. Much like Featherstone, they note that the impact of the policy actions implemented during the pandemic were limited by digital divides that persisted from previous structural inequalities. As many chapters in this volume highlight, though such interventions are often welcome, despite them under COVID-19 inequalities tended to increase. The shift of services online meant that a digitally underserved segment of the population became more likely to be deprived of access to education, health information, entertainment, and work-from-home services.

Rory Brown, Aaron Slater, and Irene Warner-Mackintosh describe the Connecting Scotland programme. All three authors were involved extensively in the development and delivery of this significant programme. Brown, Salter, and Warner-Mackintosh use this case study of a national intervention to highlight the correlation between current research into digital inequality to identify those most in need of support and the practical application of work to address this at a national scale. Importantly, the Connecting Scotland model involved engagement through third sector (voluntary and charity) organisations working directly with those at greatest risk of digital exclusion. Brown, Salter, and Warner-Mackintosh

emphasise the vital role of the 'trusted intermediaries' – key individuals within communities – acting as 'digital champions' for device recipients. They also reflect on the importance of using data gathered via sessions with hundreds of frontline staff to explore immediate challenges and opportunities for engagement with individuals and communities. In the chapter Brown, Salter and Warner-Mackintosh also reflect on the application of research in the creation of training and resources to support the Connecting Scotland programme. Brown, Salter and Warner-Mackintosh conclude with reflections on the learning from the programme. They note the need for frontline staff working with the digitally excluded to be supported to develop the digital skills they need to then support others. They also note the importance of respecting lived experience of both those supporting communities and community members themselves. Very often frontline staff may also be experiencing digital exclusion or digital poverty. Finally, they point out the importance of organisational capacity. Though frontline third sector organisations may be one of the best routes to engagement and effective, they are often under pressure themselves. Programmes such as Connecting Scotland, therefore, need to support these organisations with both financial resources and digital leadership at all levels.

Looking across all three of these chapters we can identify several common themes. First, national programmes remain important. Though the chapter by Featherstone and that by Califano and Becerra point out the potential limits of national interventions all three chapters highlight how such programmes are key to keeping digital inclusion on national policy agendas. Second, all three chapters point out that national programmes can often be limited by the challenges of local, community and structural issues. For example, all three address the issues – on various geographic and infrastructure scales of remote access as well as structural socio-economic inequality. In Australia and South America are added issues of historical inequality and legacies of colonialism and experience of significant structural inequities for indigenous peoples. The Scottish and Australian cases highlight how local communities are key. They provide the locations, organisations, and key gatekeepers who can ensure the success of interventions. Not taking these local circumstances, concerns, and resources into account can significantly limit the effectiveness of interventions. Brown, Salter, and Warner-Mackintosh emphasise, supporting these local organisations, groups, and individuals financially, with digital skills and organisational capacity is key to successful delivery.

3 COVID-19: Responses to and the Impact of COVID-19

This section explores four examples of interventions to support digital inclusion and digital literacies during COVID-19. The first three, Chaps. 5, 6, and 7, focus on educational interventions. Chapter 8 explores health communication and user content. In Chap. 5, Kim Osman, Amber Marshall, and Michael Dezuanni explore the impact of COVID-19 restrictions on digital access to education in Australia. They find, as we noted in section one of this chapter, that the sudden switch to digital learning at home revealed the extent of limited digital inclusion for many low-income and socially disadvantaged families in Australia. They highlight how many students and families struggled with access to, and the affordability of, devices and data, along with having the required digital skills. Osman, Marshall, and Dezuanni argue that this combination of digital and social disadvantage has far-reaching consequences for the educational outcomes of children from low-income families in Australia. They explore how policy, government, industry and community responses enabled children from low-income families in Australia to learn at home during the COVID-19 pandemic. The chapter concludes by discusses how such responses can be part of sustainable solutions to the digital inclusion challenges of families that enables all family members to fully participate in society now, and beyond the COVID-19 pandemic. There are clear overlaps here in the descriptions, reflections, and conclusions to the findings from Chaps. 2 and 4 in Part I.

In Chap. 6, Jenny Kennedy, Indigo Holcombe-James, Kate Mannell, and Estelle Boyle describe the Connected Students programme, a digital inclusion initiative delivered by Telstra Australia's largest telecommunications provider and the team at RMIT University. The programme directly addresses the issue of affordability of digital access for families with school age children. This lack of adequate access leading to a 'homework gap' and therefore lower educational attainment. The team highlight that this is a significant issue, citing US and Canadian work. The Connected Students programme aimed to measure the impacts of removing affordability barriers for low-income households and was delivered in partnership with a secondary college. The programme provided technology to low-income households with at least one student at the school between the ages of 15–18.

The team conclude that providing basic connections is not enough and that an holistic and integrated approach to digital inclusion is needed. They argue that providing a basic connection is not enough and that adequate devices and support for the broader network within and beyond the family is needed. Importantly, they note that successful interventions can therefore have effects beyond the school child to the other household members and the wider community. The work also highlights the importance of longer term, longitudinal, engagement in such programmes. Not only does this appear to provide time for benefits to developed and embed in households and communities but it also allows research to identify and document this longer-term impact. As noted elsewhere in this volume, engagement beyond just short-term support (e.g. limited provision of a device/service) is key for effective sustainable digital inclusion.

Çiğdem Bozdağ describes in Chap. 7 an education intervention during the COVID-19 pandemic. Bozdag focuses on the distribution of iPads for all students in primary and secondary schools in the state of Bremen during the COVID-19 pandemic. More broadly the chapter examines if and how such hardware distribution projects can be successful for mitigating the digital inequalities among the young people. The case study described by Bozdag was a participatory action research project conducted in a secondary school based in a socioeconomically disadvantaged and culturally diverse school in Bremen, Germany. The chapter presents participatory observations from January 2020 to April 2021 and three rounds of focus groups with the students. Bozdag argues that the project was successful for mitigating the immediate effects of school closures due to COVID-19 restrictions. The iPads helped the students to interact more with their teachers and structure their days better by following the school's online classes. However, students raised longer term serious concerns about the maintenance of the devices as well as the risks of surveillance by the school. These longer-term sustainability issues parallel those from Chap. 6. In many respects this chapter also provides the local detail around interventions similar to that supported by Connecting Scotland as described in Chap. 4, though under a different programme in Germany.

In Chap. 8, Anna Feigenbaum, Julian McDougall, and Ozlem Demirkol Tonnesen explore the use of user created digital content to support health communication during COVID-19. These citizen-created artistic representations of public health messages covering everything from the significance of R numbers, to being on guard for misinformation, were shared across social media to thousands of followers. Unlike the prior chapters

that explored policy interventions on national and regional scales, this chapter explores citizens own responses and the use of digital media to support health and wellbeing inclusion. Feigenbaum, McDougall, and Demirkol Tonnesen present findings from their UK Arts and Humanities Research Council funded project 'Comics in the time of COVID-19'. In this project they analysed a sample of over 15,000 web-comics distributed on Instagram between March 2020 and March 2021. They argue that, at their best, these comics amplified official public health messages, increased data comprehension, and led to more informed approaches to consuming and sharing digital media. This chapter also highlights that digital inclusion is not just about access or practical skills. As more of our social, cultural, political, and economic life moves online, citizens need the ability to contribute to that life and public debate. Though focused on COVID-19 this chapter has many overlaps and parallels to Chaps. 9 and 10 that follow it in Part III. These explore the role of creativity in supporting digital inclusion, the development of digital skills, and civic participation.

4   Digital Literacy: Creativity, Civic Participation, and Capabilities

Part III explores creativity, digital literacy, and citizens capabilities. Chapter 9 by Josie Barnard focuses on the importance of creative as a key digital skill. Drawing on work undertaken before COVID-19, Barnard argues that creativity is key to the acquisition of 'future-proof' digital skills. She asks: what exactly is 'creativity' in this context, and how can it be enabled with measurable effectiveness?. The chapter makes three main contributions to the understanding of how digital skills are acquired and developed. First, Barnard presents her findings from a small-scale longitudinal study that was conducted during COVID-19 lockdowns. This study provides evidence that creativity can be deployed to enable 'future-proof', that is sustainable and resilient, digital skills acquisition. Second, Barnard argues that the findings also improve our understanding of the role of creativity in digital skills acquisition and retention. Third, Barnard presents a new theoretical position on the role of creativity in developing resilience in the digital sphere. The chapter concludes with a discussion of the associated policy implications.

Lucie Römer in Chap. 10 explores how media literacy has increasingly become a prerequisite of full citizen participation. With media consumption, especially among youth, shifting away from the traditional media

forms and more and more towards digital or 'non-conventional' forms, media literacy training needs to address this. Römer argues that the possibility for and abilities to get involved in the public debate are not distributed equally and that Media Literacy Education (MLE) may narrow that gap. She presents a participatory action research project exploring the possibilities of the MLE for the development of citizen participation of disadvantaged youth in the Czech Republic in 2019. Römer notes that there have been fewer such studies in central Europe. Römer finds that the intervention developed the media competence of the students. However, their citizen participation activities` enhancement remained ambiguous. Like Barnard in Chap. 9, Römer makes a strong case for the importance of MLE, especially digital literacies, in relation to engaging citizens and developing citizenship. Yet, like all the prior chapters, it is clear that other social, economic, and cultural factors beyond digital media use have an impact on the ways in which these young people (citizens) translate the skills they have developed into active participation.

In Chap. 11, Rituparna Banerjee, Josef Trappel, and Leo Van Audenhove explore a digital skills and literacies intervention in India focused on developing digital skills for women. They ask: do such initiatives provide advantages to citizens at grassroots levels in smaller cities or villages?. They seek to explore how to effectively gauge the benefits of these interventions from the perspective of their recipients. The chapter foregrounds voices of the beneficiaries of Internet-Saathi—a countrywide programme in India supported by Google and the Tata Trusts. Drawing from in-depth semi-structured interviews with 17 designated 'Internet Saathis' between 2016 and 2019, the chapter explores how technological access impacts everyday lives of women in a predominantly rural, district of India. The chapter employs a combination of the Capability Approach (CA) and Choice Framework (CF) (see Nussbaum, 2002; Sen, 2009). An approach we have used in our work (Carmi & Yates, 2023) as have others in this volume. They argue that this approach privileges processes that nurture substantive freedoms and conscious actions towards women-subjects' own and others' empowerment, and their eventual attainment of 'mattering'. Banerjee, Trappel, and Van Audenhove conclude by noting a range of benefits for the women participating in the programme over and above digital skills and inclusion. They note a range of benefits that matter to the participants. Beyond the personal benefits, these included being able to help the community members with similar tasks and the valuing of the soft skills that they had acquired through the programme. They also recognise an

increase in social capital and recognition was accorded to them in their community. Though these were positive changes the participants also encountered new forms of inequality in the online sphere such as online abuse and harassment. Banerjee, Trappel, and Van Audenhove also pointed out that despite family and community support the new skills and abilities of the participants did not necessarily allow them to move beyond existing gendered social constraints. Again, as with nearly all the chapters, and in fact going back to the first Australian case study in Chap. 2, we find that digital inclusion in the form of access, skills and motivation may not be enough to transcend local or national socio-economic or cultural constraints.

In Chap. 12, we present our own work on developing the idea of Data Literacy and reflect on the potential to develop *democratic education for data citizenship*. In our work we link ideas from Dewey (1930) and Freire (1970/1996), with ideas from Nussbaum (2002) and Sen (2009), to consider how we move towards a more just datafied society (see Carmi & Yates, 2023). We argue that Data Literacy and data citizenship interventions need to build on a deep understanding of their audience and their journey towards greater data citizenship and awareness of issues in our datafied society. The chapter sets out seven principles for the development of Data Literacy and data citizenship support interventions and explores approaches to their development.

5   Linking Threads

We see eight threads linking these chapters together. First, all the chapters highlight that access is "not enough". Digital inclusion, especially digital inclusion that delivers more than passive digital consumers, requires many other elements. Second, the standard triptych for minimum digital inclusion – access, skills and, motivation – are validated and discussed across all these examples. However, third, triptych falls short where local and national socio-economic, policy or cultural contexts present additional barriers (see Chap. 3). Fourth, all the chapters emphasise the need for local engagement to help ensure success (see Chaps. 4 and 6), and also how local context can cut across, challenge, or limit delivery (see Chaps. 1 and 2). Fifth, it is notable in Chaps. 1, 5, 9, and 10 how programmes and interventions bring benefits – but not all that is hoped. History, culture, and local context beyond the digital cannot be overcome just because of the transcendental possibility of greater freedom, opportunity or benefit

that digital could bring. Sixth, throughout the chapters are examples of both citizen agency but also of how to tap into that agency and creativity, especially Chaps. 7, 8 and 9. Seventh, in one way or another each of the chapters address the link between policy, by local or national government or major organisations, with methods of delivery, interventions or outcomes. Last, of course, as noted above, the shadow of COVID-19 lies across the volume as a whole – especially the role the pandemic played in highlighting issues of digital inequality and the need for digital inclusion interventions.

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Policy and Place: Policy Interventions at a National Scale

Dirt Tracks off the Superhighway: How COVID Widened the Digital Gap for Remote First Nations communities in Australia

Daniel Featherstone

1 Introduction

In April 2021 the Australian Government announced digital inclusion as a new Closing the Gap target, aiming for digital equity for First Nations people by 2026 (Coalition of Australian Governments, 2020). The Closing the Gap target is intended to provide the incentive for government investment in measuring and tracking digital inclusion of remote Aboriginal and Torres Strait islanders. However, the COVID-19 experience suggests this is highly ambitious without a targeted and well-funded strategy to bridge the growing digital gap.

Aboriginal and Torres Strait Islander people are among the most digitally excluded population groups in Australia. While the availability of

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communications services has improved for most remote First Nations communities since 2010 this has not necessarily led to improved household access. The digital divide has become increasingly localised and impacted by remoteness, size of community, last-mile infrastructure, cost, and state-based and local initiatives. This pre-existing digital divide, particularly in remote Australia, has been exacerbated by the ongoing COVID-19 pandemic.

The digital transformation of Government service delivery has accelerated since the pandemic arrived in Australia around March 2020, premised on a misguided assumption of ubiquitous access. While many Australians quickly transitioned to working from home and online learning, those experiencing digital exclusion–including people on low income or homeless, elderly, and many in remote and rural areas–were unable to access critical health, education, welfare, and banking services.

In Australia's remote and very remote communities, hard lockdowns were put in place to avoid the introduction of COVID-19. With many community facilities, schools and service centres closed and an estimated 30% of remote Indigenous people without household access to telephony or internet, very few people had the option of doing home schooling, working from home, or accessing online services. During this time, First Nations media services played a crucial role in delivering health messages in local languages, keeping communities informed and supporting social cohesion.

This chapter outlines findings from a 2020 review of the impact of telecommunications infrastructure programs on internet access in remote Indigenous communities (RICs) and to identify outstanding needs for communities and homelands. This review was undertaken for the Australian Communications Consumer Action Network (ACCAN) about 6 months after the arrival of the COVID-19 pandemic in Australia. The chapter concludes by outlining the report's recommendations and noting subsequent policy efforts to address the growing digital divide for First Nations people in Australia, including establishing a target to close the digital inclusion gap.

2   Context

2.1   Factors Affecting Telecommunications Usage in RICS

The communicative ecology of remote Indigenous communities varies greatly due to size of community and available services, geographic

factors, history of communications access, English literacy levels, and cultural and socio-economic factors (Featherstone, 2015). Many remote households remain disconnected, with no mobile coverage in most small communities and homelands, making public phones and community access facilities or Wi-Fi the only communications services available.

Aboriginal and Torres Strait Islander people represent 3.3% of the total Australian population, with just under 20% (18.6%) of this population living in Australia's 1115 discrete Indigenous communities and homelands (ABS, 2016). Of these, almost three quarters (865) had a population of less than 50 people (Community Housing and Infrastructure Needs Survey, 2006) (Fig. 2.1).

Prior to the pandemic, household poverty levels in very remote communities were already above 50% (ABS, 2016). It is likely that this has significantly increased during the pandemic due to lack of employment, reduced access to welfare services, and high cost of food and essentials.
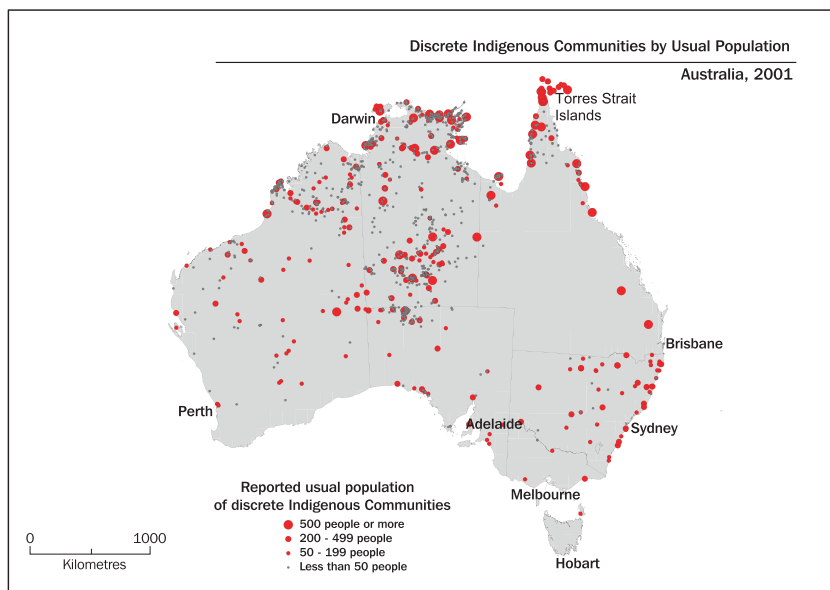
Fig. 2.1 Size and spread of discrete Indigenous communities by population, 2001. (Source: ABS: https://www.abs.gov.au/ausstats/abs@.nsf/d105255d2996ecba-ca256fe70019f3a6/ae34db3435ef319eca2572bf00195de7/$FILE/Map2_1.pdf)

Other unique challenges for many First Nations people living in RICs include limited training and employment options leading to welfare dependency, high living costs, high incidence of chronic disease and significantly lower life expectancy, high rates of incarceration, over-crowded housing, and seasonal climatic factors affecting road access and supplies and services.

While the National Broadband Network (NBN) was premised on the promise of broadband access to all Australians, this has not eventuated in remote communities. With post-paid satellite services the only option available to the majority of RICs, the vast majority of households have not signed up to avoid the risk of unaffordable bills and potential loss of services as a result, or due to insufficient credit records. As a result, NBN satellite services in RICs tend to be taken up by community agencies, staff homes or used as the basis of shared WiFi services provided by a local agency. For example NBN established a Public interest Premises (PIP) product in 2015 to enable shared use of a satellite service via WiFi with the agency able to recoup costs using voucher system. There are over 100 of these PIP services in communities, with many other agencies providing free WiFi using NBN satellite backhaul.

Where there is mobile access, pre-paid services are used predominantly due to low, unreliable incomes and large households making bill-sharing difficult. First Nations people are typically mobile-only users with device sharing common within families. This can create issues around cost-sharing, excessive use by young people, privacy and inability to tailor user settings. Facebook and other social media are used extensively to communicate, with email use uncommon for personal communications. However, the rapid uptake of mobile and social media has led to a range of cyber-safety issues, including access to inappropriate content, sexting, 'jealousing', posting of fight videos and online bullying, resulting in family disputes and even suicides (Rennie et al., 2018). To avoid these cyber-safety risks and social impacts, some communities have chosen not to accept mobile infrastructure, and others have chosen to put 'filters' on community Wi-Fi, restricting the types of content and times when access is available.

Infrastructure, however, is only one element of digital inclusion. First Nations Media Australia (2019b) identifies four key obstacles (Featherstone, 2015) to digital participation for RICs:

- *Availability* – access to services and networks, including last mile distribution and community access facilities;
- *Affordability* of mobile and internet services, devices and technical support;
- *Awareness* – digital skills, cyber-safety issues, knowledge of services and available content;
- *Appropriateness* of content and applications, interfaces, training, support and services.

With about 160 First Nations languages still spoken across Australia (ABS, 2016), English literacy is low in some regions particularly among older people, for whom English may be a third or fourth language. Online text-based services, help desks and voice-recognition services can be unusable as a result. There are many barriers to using online services, including the requirement of numerous forms of identification which many people do not have, including email address, street address, birth date and location, and home or mobile phone number.

There is also a high level of mobility and regular travel of vast distances to visit family, attend funerals and cultural activities, and access services in regional centres for health, training, shopping and government services. All of these factors need to be considered in determining appropriate communications modes.

2.2 Measuring the Digital Gap for First Nations People

The Australian Digital Inclusion Index (ADII) is an annual survey of digital inclusion levels across the country. The ADII measures digital inclusion across three dimensions: access, affordability, and digital ability. Undertaken by RMIT and Swinburne Universities, with support from Telstra, the ADII is the only national measurement tool of digital inclusion in Australia (Fig. 2.2).

The ADII shows that the digital inclusion gap between First Nations people and the national average reduced from 2014 to 2018 but has widened in recent years from 5.8 in 2018 to 7.9 in 2020. This gap is evident across each of the three Index dimensions, with the greatest gap in digital ability (Thomas et al., 2020; see Table 2.1).

Data collection for the ADII, however, only includes urban and regional First Nations people and not those living in RICs. Clearly the range of

Digital Gap- ADII 2016-20
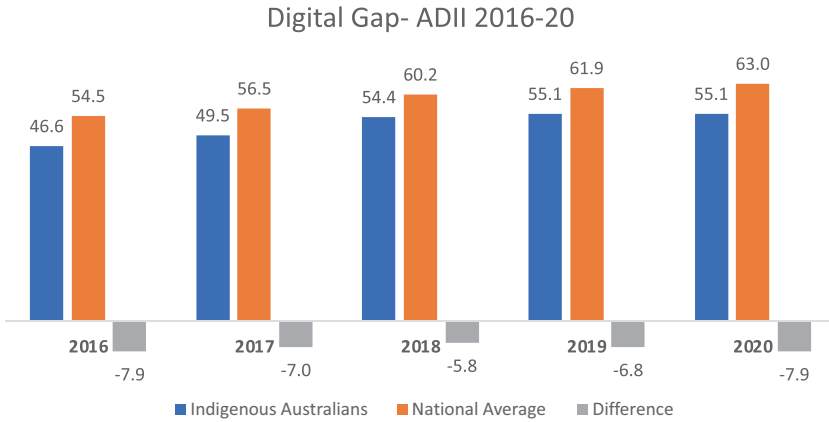
Fig. 2.2 ADII results for Indigenous Australians 2020

Table 2.1 ADII results for Indigenous Australians 2020

ADII 2020	Access	Affordability	Digital ability	Digital inclusion index
Indigenous Australians	68.5	54.0	42.8	55.1
National Average	76.3	60.9	52	63.0
Difference	*−7.8*	*−6.9*	*−9.2*	*−7.9*

these barriers are more extreme in remote and outer regional Australia, however there is little quantitative data to measure the scale of the remote digital gap (ACMA, 2008; Rennie et al., 2019). Indeed, prior to the research discussed here, there had not been a comprehensive review of communications infrastructure and government programs in RICs since 2008, with the National Broadband Network established and a range of other programs implemented to improve communications access in remote and regional Australia since then. However, there was no coordinated data collection to identify the impact of these programs on First Nations household access or usage or outstanding connectivity gaps (First Nations Media Australia, 2019a).

To address this lack of remote community data, the ADII undertook supplementary case studies in Ali Curung, Northern Territory in 2018 and Pormpuraaw in far north Queensland in 2019. These studies found

Table 2.2 ADII Case Study results for Ali Curung 2018 and Pormpuraaw 2019

	Access	*Affordability*	*Digital ability*	*ADII SCORE (GAP)*
Ali Curung NT 2018 (Population 500)	47.3	25.8	52.3	42.9
National Indigenous ADII Score 2018 (Gap)	68.5 (−21.2)	49.7 (−23.9)	45.0 (+7.3)	54.4 (−11.5)
National average ADII score 2018 (Gap)	73.4 (−26.1)	57.6 (−31.7)	49.5 (+2.8)	60.2 (−17.3)
Pormpuraaw, Qld 2019 (Population 750)	*50.1*	*9.0*	*51.4*	*36.7*
National Indigenous ADII Score 2019 (Gap)	68.4 (−18.3)	52.4 (−45.4)	44.4 (+7.0)	55.1 (−18.4)
National average ADII score 2019 (Gap)	75.7 (−25.6)	59.2 (−50.2)	50.8 (+0.6)	61.9 (−25.2)

the digital gap significantly increased with remoteness, to 17.3 and 25.2 respectively (see Table 2.2), particularly in the areas of Access and Affordability.

Apart from ADII reports, most data on First Nations internet use is more than 5 years old. The 2014–2015 National Aboriginal and Torres Strait Islanders Survey (NATSISS) found that 71.1% of metropolitan Aboriginal and Torres Strait Islander people used the internet every day, compared to 36.5% in remote areas and 19% in very remote areas. Remote users were found to rely primarily on out of home access.

The 2016 ABS Census found that 75.3% of Aboriginal and Torres Strait Islander households are accessing the internet, compared with 85.8% of all Australians. Usage varies significantly based on location with 82.8% internet access in major metropolitan areas, compared with 73.2% in regional areas, 61.3% in remote areas, and 49.9% in very remote areas (Rennie et al., 2019). The ABS removed the internet connectivity questions from the 2021 census preventing future comparison.

A 2016 survey of 401 homelands and outstations in Northern Territory (CAT, 2016) found that only 20% of homelands had mobile phone access, 37% had internet access and, of those communities, 80% had only a single internet access point.

In terms of device access, a 2016 remote communities survey undertaken by Indigenous Remote Communications Association found that 77% of people owned or shared a mobile phone, 39% owned or accessed a

desktop or laptop computer, and 22% had a home landline phone. Overall internet access was found to be 71% (IRCA, 2016).

The remote digital gap has been exacerbated by the pandemic, however there is a lack of data to quantify the full impact.

3   IMPACT OF COVID-19

The COVID-19 pandemic arrived in Australia in March 2020, with international and state borders closed to prevent the virus' spread. In remote communities, there were hard lockdowns on non-essential visitors and closure of schools and many local services facilities to prevent the potentially devastating impact of the pandemic. Aboriginal and Torres Strait Islander people are particularly vulnerable to COVID-19 due to high chronic disease rates, overcrowded housing, high mobility, and limited access to medical facilities.

While the restrictions successfully kept COVID-19 out of remote communities during 2020, it resulted in many remote people having limited access to essential services. This was exacerbated by digital exclusion. The first cases in RICs began in western NSW communities in August 2021, with rapid spread to over 30% of Wilcannia's population in and continued outbreaks in other towns. Northern Territory's first major outbreak in November 2021 led to concerns the Delta variant would spread rapidly to remote communities with devastating impact. WA, SA and Queensland have managed to contain outbreaks from reaching remote communities to date.

As much of Australia moved to remote work and schooling and many government services transitioned to online delivery, average monthly data usage rose 60% to 330GB per user nationally (ACCC, 2021). However, in remote communities, with already limited household connectivity and high data costs, working or learning from home was rarely an option.

National news stories and reports began to highlight the lack of communications access and impact of the digital divide in remote communities during this period. A World Vision report found that one in four First Nations households had no internet access, with many children in remote communities unable to participate in schooling (Winch, 2020). With schools closed for weeks or months at a time, the shift to online lesson delivery and videoconferencing was not possible in remote communities. Some remote schools hand delivered learning resources to households but there was typically low engagement in home schooling. In 2020 NBN's

remediation efforts through its Communities in Isolation project provided free satellite delivered Wi-Fi facilities into 54 communities. Initially intended as a short-term program, it has been extended until 2023 with another 50 sites planned to receive the Wi-Fi services in 2022. Unfortunately this had limited overall impact on remote school attendance.

An outbreak of COVID-19 in Wilcannia community in August 2021 led to national awareness of the low vaccination rates in remote communities. However, with vaccination misinformation spreading faster than the vaccination roll out to remote communities during 2021, there was vaccine hesitancy in many remote communities. This led to continued lockdowns and further delays in return of some local services.

Throughout the pandemic, First Nations radio and TV services played an important role in keeping people informed and connected and sharing government health messages using trusted local voices, including in language. Over 47% of First Nations people have access to a First nations radio service (IRCA, 2016) with satellite-delivered TV services (National Indigenous TV, Indigenous Community TV) available to remote households nationally. Some communities developed innovative local strategies to connect their communities and continue services such as school lessons and elderly support. For example, Wilcannia River Radio provided daily school lessons via radio and a range of community support programs.

4   Outcomes of Remote Indigenous Communications Review

4.1   *Materials and Methods of Review*

The review was undertaken in two parts: (1) a summary of previous and existing communications infrastructure programs and government and industry investment; and (2) outstanding communications needs of remote communities identified through community consultation. This involved a wide-ranging desktop research of existing data, research and grey literature and consultation with state and federal government agencies, industry stakeholders, First Nations organisations and remote community stakeholders.

The review identified outstanding needs in remote communities through analysis of grey literature, news articles and review submissions, as well as phone and email consultation with representatives from First

Nations peak agencies and community-based or regional organisations across the country.

The review also considered the potential impact of emerging technologies such as low-earth orbit satellite.

4.2   Telecommunications Infrastructure and Access Programs for Remote Indigenous Communities

While Federal and State governments have collected data on availability of communications services, only limited data is publicly available online.[1] Despite this lack, there has been significant improvements in telecommunications coverage and digital connectivity in RICs over the last decade. This is largely due to the introduction of the NBN Sky Muster satellite, the Mobile Black Spot Program (MBSP), State/Territory government co-investment programs, the Community Phones Program, and local initiatives to provide shared WiFi services and access facilities. Taken together, approximately $155 million was invested in communications infrastructure for RICs nationally from 2015–2020, excluding undisclosed investment by telecommunications companies, and the cost of the NBN SkyMuster satellites (see Table 2.3).

While governments and industry have given increased attention to the communications needs of RICs due to the pandemic, digital transformation of government services, social responsibility targets, and NBNCo's focus on digital inclusion following the rollout completion in June 2020. Despite this increased need, federal funding for Indigenous-specific communications programs had declined since 2010.

While figures vary between states, most RICs with populations over 200 now have mobile coverage and most homelands and outstations with populations under 50 have a public phone. Nearly 300 of these are WiFi-enabled. Small to medium-sized communities (population <200) are the most underserved cohort, with many having only a public phone and no internet access.

The opportunities for expanded mobile coverage under mainstream programs such as the MBSP, which require at least 50% state and/or industry co-investment, have now been largely exhausted for RICs due to market failure owing to sparse populations, remoteness and/or lack of

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[1] For example, the Mobile Black Spots Program on data.gov.au and WA Government's Digital Infrastructure Atlas on https://www.agric.wa.gov.au/digitalinfrastructureatlas.

Table 2.3 Approximately $155 million of Federal, State/territory and industry investment from 2015–2020 resulted in improved connectivity in RICs

Agency	Program	Total funding(2015–2020)	Indigenous specific
Australian Government	Indigenous Comms programs	$14 m	Approx. $14 m
	Mobile Black Spot Program	$380 m +$160 m (Rounds 5 & 6)	Approx. $30 m for 43 sites (est.)
	Regional Connectivity Program (upcoming)	$53 m	N/A
WA Government	Regional Telecomms Programs	$85 m since 2015	Approx. $15 m
NT Government	Co-investment in remote mobile services	$15 m (2015–2018) + $14 m (2019–2022)	$29 m
SA Government	Mobile Phone Black Spots Fund	$10 m	$5 m (for APY Lands rollout)
QLD Government	Mobile Phone Black Spots Fund		$5 m (est.)
TSRA	Torres Strait Digital Expansion Project	$7.32 m	$7.32 m
NSW Government	Connecting Country Communities Fund	$50 m	Not defined
NSW Government	Regional Digital Connectivity program	$400 m	Not defined
VIC Government	Connecting Regional Communities Program (CRCP)	$45 m	Not defined
	Victorian Mobile project	$55 m	Not defined
TAS Government	Flinders Island and Cape Barren Island Telecoms Project	$11 m	$11 m
Telstra	NT Mobile Co-investment Project	$28 m over 2019–2022	$28 m
	MBSP co-investment		Not defined
Optus	MBSP		Not defined
nbn co	'Communities in Isolation' program	$0.5 million (estimate)	$0.5 million (estimate)

terrestrial backhaul infrastructure. This points to the need for a targeted, and fully funded program to ensure a next-level digital divide is not set up between larger and smaller communities, or a localised divide between service providers and Indigenous households within communities.

National Telecommunications Programs

Since 2010, the Australian Government's communications budget has centered on the NBN, Mobile Black Spots Program and recently the Regional Connectivity Program, leading to significant improvements in satellite and mobile connectivity in RICs.

The NBN was established by the Rudd Labor Government in 2008, promising to provide fast broadband to all Australian households. A fibre-to-the-premises (FTTP) solution was planned for 93% of Australian households, with 4% fixed wireless on the periphery of urban and large regional centres, and a satellite solution across the remaining 3% of Australian households. The FTTP approach was later changed by the Abbott Government in 2013 to a mostly fibre-to-the-node solution using a multi-technology mix. A satellite solution was determined for remote Australia, with NBNCo launching two SkyMuster geo-stationary satellites in 2015 and 2016. Customers must sign a contract with a Retail Service Provider (RSP) with post-paid plans and await installation by NBNCo. Costs start at $35/month for a 12/1MBps plan or from $50/month for 25/5Mbps SkyMuster Plus services. Since April 2020, all traffic on Sky Muster Plus plans was unmetered except for video streaming and VPN use. While this has addressed the need for fast, reliable satellite broadband at a comparable rate to urban broadband rates, there has been very low take-up by remote Indigenous households due to having post-paid options only. In 2015, NBNCo established a Public Interest Premises (PIP) satellite product to enable local agencies to establish shared WiFi using pre-paid vouchers. There are now over 100 PIP services in place in remote communities.

The Mobile Black Spots Program (MBSP) is a federally managed co-investment program to expand mobile coverage to identified regional and remote towns and highways. Under the first five rounds, the Government's commitment of $380million generated $836 million investment to deliver 1229 new base stations across Australia. This included approximately 41 base stations in and around RICs, particularly in northern Australia. The Government has since run round 6 of the MBSP as well as a $53 million

Regional Connectivity Program, a more flexible program to address congestion or patchy coverage, support backhaul upgrades, satellite small cell or WiFi solutions.

The Australian government (through NIAA) currently funds public phones and WiFi services in small RICs and homelands. The program, managed by Australian Private Networks (APN), provides up to 301 fixed solar-powered phone booths to communities of less than 50 people. Since 2013 about 98% of these phone booths were upgraded to include satellite WiFi hot spots. APN's contract also involves servicing an additional 245 public phones in RICs. Telstra operates an additional 573 public phones, which remain a primary means of communications for many people in RICs.

There has also been the Universal Service Obligation (USO), a $270 m per annum industry/government funded contract awarded to Telstra since 1991, a safety net program aimed at providing equitable access to standard telephony services, payphones, emergency and disability services nationally. However, data, mobile telephony and pre-paid services are not included in the USO, making it an outdated instrument despite ongoing legacy contracts continuing to 2032. In 2018 the Department of Communications and the Arts developed a new Universal Service Guarantee (USG), which updates the USO by ensuring all Australian homes and businesses have access to both broadband and voice services, regardless of their location. NBNCo is listed as the Statutory Infrastructure Provider, or provider of last resort.

An Alternative Voice Services Trial is currently underway to assess the effectiveness of alternative means of delivering voice services in rural and remote Australia, particularly those areas currently serviced under the USO.

State Government Programs

While telecommunications is primarily a federal Government responsibility, Australia's state and territory governments have co-invested in mobile infrastructure and other infill programs over the last decade - particularly in WA, NT and Queensland.

WA Government have been proactive in monitoring and addressing telecommunication gaps in remote communities and has invested $125 million since 2012 to expand mobile coverage and reduce communication gaps in small communities across regional and remote Western Australia.

As a result, WA's level of mobile coverage in RICs is exceptional compared to most other states, with all but two communities of over 100 people having coverage, including 84% of medium sized communities (50–200 people) and 45% of small communities and homelands.[2] WA Government has also funded an innovative trial of small cell mobile coverage and community-wide WiFi Mesh rollout in Tjuntjuntjara community, with aggregated data use and VoIP phones in all houses. WA Government (DPIRD) is expanding the rollout of WiFi to other remote communities as a place-based approach, a model that could be adopted in other states.

Northern Territory Government (NTG) have implemented a range of programs to identify and address the specific needs of remote Indigenous communities in the NT despite very limited budgets. With a 32% Indigenous population, of which approximately 79% live in the 400+ remote communities and homelands across the NT, NTG have focused initial efforts on providing mobile coverage to larger communities (over 200 people) where there was existing fibre backhaul. For NT, 84% of communities with population over 200 have mobile coverage, 50% of medium sized communities have coverage and less than 4% of the 644 family outstations and small communities have mobile coverage. While NTG are now seeking low-cost solutions to connect smaller communities, it acknowledges there is still much work to be done, with "21 remote communities (over 100 people) with no mobile phone service, 33 with no fixed internet service (ADSL) and 37 connected to the NBN via unreliable or unsuitable satellite services in 2018" (NTG, 2018).

Queensland government had provided co-investment under the Mobile Black Spot Program and other federal programs to provide or upgrade mobile services in most of the larger RICs. It was also undertaking a joint project with the Torres Strait Regional Authority (TSRA) and Telstra to upgrade and expand the mobile network in the Torres Strait region. Due to concerns about the limitations of satellite broadband delivery and lack of planning for NBN fibre expansion, Queensland Government funded the establishment of a fibre backhaul network Queensland Capacity Network (QCN) to increase areas that can be reached by fibre.

Each of the other states – NSW, SA, Victoria and Tasmania – have set up funding programs to expand and improve mobile coverage, including through co-investment in with the Mobile Black Spots Program, and

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[2] Source: WA Government remote community telecommunications infrastructure audit 2020 (not public).

provide public WiFi services in some regional towns. While these have mostly supported regional areas, there has been improvement in mobile coverage in the remote Anangu Pitjantjatjara Yankunytjatjara (APY) Lands of SA, with six new mobile base stations installed in 2018.

With the Internet-of-Things reaching remote and rural communities, there is increasing need for reliable connectivity for remote activation and monitoring of pumps, tanks and generators and other applications.

Industry Programs

Since completing the national rollout of the fibre and fixed wireless network in mid 2020, NBNCo has turned its focus to connecting customers to its network and improving services, including SkyMuster satellite services. As a COVID-19 response, it provided up to $150 million of financial hardship relief for low-income households and small businesses, as well as increased data allowances. NBNCo has taken a particular focus to improving digital capability and engagement, including in remote Indigenous communities where it has installed over 50 free WiFi services to support engagement with home schooling in small under-served communities and homelands. As noted above this Communities in Isolation program was initially a short-term response during the pandemic but has been extended with Wi-Fi equipment to remain for 3 years, and is to be expanded to up to 100 sites. With end of life for Sky Muster in about 2030, NBNCo is looking at ways to expand terrestrial and low-latency broadband delivery in regional and remote Australia, including possible use of Low Earth Orbit (LEO) satellite constellations.

Telstra has been involved in a range of co-investment programs with state governments in WA, NT, Queensland and SA to expand mobile coverage and deliver tele-health services and improved school connectivity in RICS. It has committed to further mobile co-investment and tele-health services in RICs under its Reconciliation Action Plan. Telstra is also now providing a satellite small cell mobile option to communities without fibre backhaul, with funding support through the MBSP, Regional Connectivity Program or community co-investment.

As well as co-funding mobile phone coverage in 13 NT communities, Telstra funded the inDigiMOB Digital inclusion program, delivered by First Nations Media Australia in over 20 NT communities.[3] Initially funded from 2015–2019, funding was extended in 2020 for an additional

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[3] See inDigiMOB.com.au for program details.

3 years to expand the program with inter-state reach. Telstra also funds several other digital inclusion programs including the Indigenous Digital Excellence community training program. Until 2020 this provided digital workshops to school groups in remote communities, run by National Centre for Indigenous Excellence. The Deadly Digital Communities, run in Queensland's Indigenous Knowledge Centre network in partnership with State Library of Queensland. Telstra also supports several digital inclusion research initiatives including the Australian Digital Inclusion Index (ADII), cyber-safety research in communities and the new 'Mapping the Digital Gap' project.[4]

Telstra delivers the USO contract to ensure equitable and reliable public phone access, fixed line telephony and emergency communications services in remote and rural areas of Australia. The USO contract is approximately $270 million a year, co-funded through government and industry contribution. The contract has been extended to 2032, however a replacement USG is now in place to include data and mobile services (Department of Communications and the Arts, 2018). During the pandemic, Telstra made calls free from its 573 payphones in RICs. Telstra extended this nationally in 2021, making calls to fixed line and mobile phones free of charge from all 36,000 payphones.

The other large telecommunications companies, Optus and Vodafone, have limited services in remote communities due to Telstra's legacy ownership of the fibre network and mobile infrastructure throughout much of regional Australia. Optus have made some in-roads in mobile delivery through MBSP funding, including satellite delivered small cell in communities without fibre backhaul.

Other smaller communications companies, including Australian Private Networks (APN) and Easyweb Digital, have played a significant role as retail service providers of NBN satellite services, including the Public Interest Premises (PIP) product. Both companies offer WiFi solutions which enable community agencies to on-sell pre-paid data using a voucher system. Numerous organisations use these services to provide a mix of managed public and pre-paid WiFi in communities and tourism sites, including Northern Territory Library, WA Government, Central Australian

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[4] The 'Mapping the Digital Gap' project is a four-year study (2021–25) measuring digital inclusion in 10–12 RICs project being undertaken at RMIT University and Centre of Excellence for Automated Decision-making and Society, with the author as lead Investigator.

Youth Link-Up Service (CAYLUS). As outlined above, APN are also contracted to manage 546 public payphones in small communities and homelands.

Two international companies, Starlink (Space X) and OneWeb, are currently setting up Low Earth Orbit (LEO) satellite constellations to deliver low-latency satellite communications services. While Starlink currently had only 1600 of a planned 12,000 satellites in orbit, it began delivering high speed services in Australia from 2021. While costs for up-front equipment and services are currently more expensive than NBN SkyMuster, LEO services are already becoming an attractive alternative for agencies and customers requiring high speeds and low latency for tele-health, online learning and other high bandwidth applications.

Digital Inclusion and Support Programs

Over the last 2 years there have been digital inclusion plans developed by WA, Victoria and NT Governments. However, there is currently no coordinated national digital inclusion plan to align policy and funding efforts, despite a digital transformation strategy aimed at having all government service delivery online by 2025.[5]

Since the late 1990s, there was a succession of targeted Australian Government programs aimed at providing IT facilities, internet access and training into RICs. These include the Networking the Nation program (1998–2003), Telecommunications Action Plan for Remote Indigenous Communities (2003–2006), Backing Indigenous Ability (2006–2008), and the Indigenous Communications Program (2009–2013). While these programs had relatively low budgets to address the scale of need (e.g. $8.3 million over 3 years for TAPRIC), they helped provide ICT access and awareness in some regions. However, without recurrent funding, there has been little continuity or progression from one program to the next. Since 2013, there has been no targeted program for ICT access and skills development for First Nations people, despite the growing digital gap.

Since 2014/2015, the main activity under the replacement Remote Indigenous Communities Telecommunications Activity (RICTA) has been the Community Phones Program, providing public WiFi phones in small homelands as outlined above. RICTA has an annual budget of about

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[5] Source: https://www.afr.com/technology/all-federal-government-services-to-be-online-by-2025-20211203-p59elv.

$4 million. It was managed by Department of Prime Minister and Cabinet (DPMC) from 2014–2018 and National Indigenous Australians Agency (NIAA) since then. Other activities included a Community WiFi Trial program in five communities and development of a digital inclusion app with IT learning tools and cyber-safety information called 'Your Online Journey'. Other targeted digital literacy initiatives include *Be Deadly Online*, an online cyber-safety resource package, an awareness campaign called 'Keep Our Mob Safe Online' and a Scamwatch program by Australian Competition and Consumer Commission (ACCC) to increase awareness of scams.

While the Australian Government has moved away from funding community access internet facilities in the last decade, various State Government and NGO initiatives have continued to support remote access facilities, mostly in locations with local staff capacity and operational support. These include Central Australian Youth Link-Up Service (CAYLUS), which supports 28 computer rooms and free WiFi hotpots in Central Australian communities, the Indigenous Knowledge Centre network supporting 31 public library and computer access centres across Queensland, and the Community Resources Centre Network providing internet and community services to 100 regional towns and six remote communities in WA. The inDigiMOB digital inclusion project,[6] managed by First Nations Media Australia, and Deadly Digital Communities training in Queensland, both funded by Telstra, are two of the main digital skills and support programs currently going, with more needed. The inDigiMOB project, established in 2016, provides digital training and support for community digital mentors in 23 remote NT communities.

4.3   Outstanding Needs in RICs

Access Issues
Although communications availability has generally improved due to enhanced infrastructural provision, there has been little improvement in household access. The digital divide has become localised, typically between service agencies and residents within communities, but also by job/role, age, income, and location of residence. While most agencies and

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[6] See https://indigimob.com.au/.

staff residences report improved internet access, there remains limited household connections and, in smaller communities and homelands, virtually no internet access where public WiFi is not provided. The next level challenges of last-mile delivery and ICT access remain unaddressed for many sites.

With many service facilities and computer rooms closed during COVID-19 lockdown periods, and public Wi-Fi turned off in several communities to avoid congregation and virus spread, many people were without internet access for months throughout 2020. And Although the Jobkeeper program ensured employed people continued to receive wages while unable to work, there were reports of Centrelink unemployment benefits being cut for people who missed reporting dates due to lack of phone or internet access.

The quality and reliability of mobile services remains an issue in many places, with descriptions of patchy or unreliable coverage and high congestion at peak use times. This may have been exacerbated by the heavier reliance on mobile for broadband access during COVID-19 restrictions, as well as increased data usage for video streaming and other data-hungry applications. ADSL services were also heavily congested and unreliable, with local or regional exchanges needing upgrades to meet demand.

Many communities reported communications outages, including mobile and public phones, sometimes lasting up to days or weeks. With a lack of backhaul redundancy or alternate connectivity options in most communities, whole communities were unable to communicate, buy food and supplies, or access essential services during outages. This created a serious health risk with high incidence of diabetes and other health conditions, with some communities providing food drops or store vouchers to households.

Power outages also affected communications services in communities typically reliant on local diesel generators. NBN satellite, WiFi services and satellite small cell mobile rely on community power supply, which can be unreliable especially during emergencies. Backup batteries and/or solar power cells are needed to ensure reliability. Also, with pre-paid power meters installed in remote households in several states, inability to afford power cards also precludes use of household satellite equipment, Wi-Fi or television.

In northern Australia, where community road access can be cut for months during tropical wet season, many agencies highlighted the

limitations of satellite services to access emergency information during cyclones and emergencies due to rain fade. There were calls for increased terrestrial communications broadband rollout (via fibre optic or microwave) across northern Australia as well as redundancy services for emergency use.

In sites without mobile coverage, there were numerous calls for infrastructure upgrades to telephony and ADSL infrastructure to ensure ongoing reliability and availability of phone lines. Several people raised safety concerns about sole reliance on payphones for communications in many small communities, particularly during emergencies or domestic violence situations, where use may not be safe or viable.

There was demand for more public access Wi-Fi services with routers to enable local management of content filtering, data allowances and usage times. However, organisations providing Wi-Fi services argued the need for funding support to enable free access.

Affordability Issues

As previously outlined, affordability continues to be the key factor in this growing digital divide. Most people opt for pre-paid mobile services due to low, unreliable incomes. Other barriers to using post-paid billed services include inability to sign up for plans remotely and reluctance to pay for shared services or risk excess data costs.

With Telstra fined $50 million by ACCC in 2020 for unconscionable sales practices due to several regional Telstra shops selling unaffordable mobile plans to low-income customers, and research by MoneyMob Talkabout finding hundreds of central Australian Indigenous consumers had accrued large mobile phone debts totalling over $1.1 million (Cartwright & McAuliffe, 2020), it is understandable why post-paid services are viewed cautiously.

With call costs reduced, data costs make up the primary expense on pre-paid mobile. Pre-paid data costs up to $4/GB compared with under $1/GB for post-paid. In remote communities, there is generally a lack of mobile phone options, limiting people's ability to select an affordable or appropriate plan. Telstra established a $30 Value Mobile plan for healthcare card holders, however data use is speed-capped after the first 2GB and there is limited awareness of this option. Since the ACCC ruling, Telstra has developed a targeted awareness campaign to address this issue.

With so many government services now online, there is a need for unmetered access to government, education and key services in remote

communities. The Review recommended that WiFi mesh networks be established in small to medium sized communities without mobile coverage or an existing WiFi service, enabling free access to online services and optional pre-paid vouchers to access video or non-essential services. Arrangements should be made with telcos to enable unmetered access to key services on mobile networks.

While shared Wi-Fi currently provides relatively affordable access to data in many communities, usage costs vary with some provided free by a government or local agency, usually with daily data limits, and others using a pre-paid voucher system. With voucher costs set locally, and reports of price gouging in some communities, there is a need for recommended voucher rates.

Use of online media platforms and streaming services is increasing data demand in remote communities, however pre-paid costs make heavier data use unaffordable. Several respondents called for increased data allowances for shared WiFi services. With NBN PIP plans providing only 150GB of monthly data, which some communities exceed within days, the report recommended significantly increasing PIP data capacity and transferring to SkyMuster Plus to enable unmetered basic use.

Digital Ability Issues

While First Nations people are rapid adopters of communications technologies when available, and will share digital skills with family and peers, there are limited programs in place to provide ICT training and support in communities (See section on Digital Inclusion and Support Programs in 4.2 above). This limits the awareness of relevant services, tools and online content that will drive engagement with ICTs and the skills development needed to improve training and employment opportunities.

The report urged recurrent funding for locally run digital skills programs, as skills development happens over years not in a single workshop. However, to be successful, training needs to be culturally appropriate and involve local agencies and mentors able to provide support when and where needed. Having locally relevant content on computers and user-friendly services for people with limited English and digital literacy helps build engagement. The predominance of mobile-only usage results in skills in mobile-friendly services and apps, but little development in keyboard skills and PC-based applications needed for schooling, training courses and many workplaces.

Trust is also a key issue in digital engagement, particularly with numerous stories of online scams and the negative impact of social media through 'jealousing', sexting, online bullying and posting of fight videos, creating conflict and even suicides in communities (Rennie et al., 2018). Awareness of cyber-safety issues and scams, as well as appropriate use of social media, are all necessary skills in operating safely online.

The report supported calls for establishment of a First Nations Technology Council to coordinate communications programs aimed at First Nations people and building business skills and opportunities. This could include establishment of an Indigenous owned ISP to provide affordable internet access and appropriate services and support.

5   Key Recommendations and Conclusion

There have been significant improvements in telecommunications coverage and access across remote Australia due to the introduction of the NBN Sky Muster satellite, the Mobile Black Spot Program, State/Territory government co-investment programs, and provision of shared WiFi services and access facilities. However, with market failure preventing further industry co-investment, fully funded investment is needed to avoid a next-level digital divide between and within communities.

The COVID-19 pandemic has highlighted the need for targeted programs to address outstanding access needs, affordability and digital literacy in remote Indigenous communities. Significant gaps remain in digital access and usage due to issues of affordability, lack of last mile delivery or community access facilities, issues with service reliability and congestion, limited technical support, skills and cyber-safety awareness, and barriers to engagement with online services.

A place-based approach is needed to address these next level obstacles, consider local context and needs, ensure culturally appropriate and sustainable solutions. The report recommended support for localised digital inclusion plans, with a flexible funding program to enable locally developed strategies to address identified barriers, building community capacity and ownership and greater engagement in the solutions.

The report called for funding to measure digital inclusion levels in remote Aboriginal and Torres Strait Islander communities to address the lack of reliable and current data and removal of the internet access

questions from the national Census. This data is needed to determine whether the digital gap in increasing or decreasing and guide funding to address key challenges. While the lack of ADII data collection in remote communities is now being partly addressed by a supplementary Telstra-funded project begun in 2021,[7] a more comprehensive data collection program is needed to effectively track progress on the Closing the Gap target.

The report concluded with the urgent need for a targeted and coherent Indigenous Digital Inclusion Strategy to coordinate effort and maximise impact over time. The 2018 Regional Telecommunications Review (RTR) had recommended a "targeted Indigenous Digital Inclusion program with a focus on access, affordability and digital ability be developed in partnership with Indigenous communities." (RTIRC, 2018). In its response, the Australian Government committed to developing an Indigenous Digital Inclusion Plan, however there was no progress until September 2021. The National Indigenous Australians Agency released a discussion paper for input and coordinated an Indigenous-led roundtable process undertaken and working group to develop the Plan, due in early 2022. Many organisations raised concerns that without an associated budget, a Plan may have limited impact.

With the Omicron strain of COVID-19 now reaching many remote communities and lockdowns likely to continue well into 2022, there is increased urgency for targeted solutions to address the growing digital divide for remote First Nations people. Without affordable and reliable communications, it is likely that many of the new Closing the Gap targets, including health, education and employment, will not be reached and remote First Nations people will be increasingly excluded from Australia's social, economic and digital future. The report urged that data on telecommunications services in RICS be publicly available, enabling analysis of gaps in connectivity and access.[8]

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[7] This project, to measure digital inclusion in 12 remote communities nationally over 3 years, is being undertaken by the Centre of Excellence for Automated Decision-making and Society through its RMIT University hub from 2021–2025, led by the author of this article.

[8] The Australian Communications and Media Authority published the last comprehensive government report on telecommunications in remote Indigenous communities in 2008 (ACMA, 2008).

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Policy Interventions to Address Digital Inequalities in Latin America in the Face of the Pandemic

Bernadette Califano and Martín Becerra

1   Introduction

After the outbreak of COVID-19 in Latin America at the end of February 2020, the governments of the region established preventive isolation and mandatory social distancing measures designed to mitigate the spread and contagion of the virus. The population was asked to remain at home and there was a sudden increase in the activities that relied on telecommunications networks, including various forms of telework, distance education, telehealth, electronic commerce, digital entertainment and virtual social interactions. All this led to a surge in the use of online services, particularly video streaming, and a growth in data traffic, as several of the activities that were usually carried out offline began to take place online. In order to facilitate access conditions for the population, the governments

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implemented a series of public policy initiatives, including regulations on connection speeds, pricing, data traffic, digital infrastructure, and use of the radio spectrum, along with recommendations on the responsible use of networks.

This chapter analyses these public connectivity policies introduced in different Latin American countries during the first months after the outbreak of COVID-19 reached the region (March–June 2020). The analysis has a three-fold objective: (a) to give an overview of the status of connectivity in five big Latin American countries – Argentina, Brazil, Chile, Colombia and Mexico; (b) to study comparatively the public connectivity actions implemented by the governments of each country to face the pandemic; and (c) to provide insights in relation with telecommunications policies in the context of pandemic emergence at a regional level.

The research is a comparative qualitative study. The mentioned countries have been chosen for two main reasons: they are the biggest in the region terms of population, economies and per capita gross product (ECLAC, 2019), and they have exhibited responses to all the variables selected for the analysis. After a preliminary inquiry about the main policy initiatives taken in each country, we determined that it was possible to make a comparative study around four variables:

1. access and continuity of connectivity services
2. traffic, data consumption and content
3. Infrastructure, network management and radio spectrum
4. Compensations for telecommunications companies

The study draws on an analysis of the set of regulations and specific policy-making actions introduced in the field of connectivity in the countries under review, as well as official documents prepared by the public sector, particularly by the telecommunications ministries and regulatory bodies in each country. It also draws on documents from the private sector, and statistics on ICT access and usage in the region.

The argument is put forward that Latin American governments, through various strategies, responded quickly to the spike in demand for connectivity posed by the context of the pandemic, partly because they had learned from what had happened in other latitudes and partly because of the legacy of public policies resulting from previous experiences in the sector (Balán & Montambeault, 2020). Thus, they implemented a series of efforts designed to address the situation and mitigate possible damages.

However, the digital divides that persisted from previous structural inequalities lessened the impact of the actions implemented during the first months of the pandemic. Likewise, these actions revealed that inequalities tend to increase, as a digitally underserved segment of the population becomes deprived of access to education, health information, entertainment, and work-from-home services in their various forms in this context.

After this first introductory section, the conceptual approach is explained. The third section provides a regional overview of Latin America in terms of connectivity and digital access to information and communication services, emphasizing the inequalities that are identified between countries. The fourth section deals with the actions implemented by the governments of Argentina, Brazil, Chile, Colombia and Mexico in terms of connectivity during the first stage of the pandemic (March–June 2020). Finally, we provide some insights on connectivity policies in the context of pandemic emergence at a regional level.

2   Public Policies and the Digital Divide: A Conceptual Approach

Public policies consist of a set of actions and decisions in specific fields of public management (economic, labor, social, cultural, communications, telecommunications, etc.), which undergo a social process with interactions and negotiations between several actors (Califano, 2015; Oszlak & O'Donnell, 1984; Vilas, 2011).

As Van Cuilenburg and McQuail (2003) have pointed out, the main elements of media and telecommunications policy, leaving aside differences between contexts, consist of the

- Goals or objectives to be pursued
- Criteria by which these goals are recognized
- Various content and communication services to which policies apply
- Different distribution of services
- Appropriate policy measures and means of implementation

Telecommunications policy as a field has been thoroughly studied in Latin America, mainly focused on the political dynamics of market-oriented reforms in the late twentieth century (Murillo, 2009). The implications that regulatory convergence entails for the telecommunications

and ICT services sector have also been studied at a regional level (Wohlers, 2008), together with country-specific case studies (Barrantes, 2008; Galperin & Cabello, 2008; Mariscal, 2007).

Latin America and the Caribbean as a region displays a structural and distinctive socioeconomic fracture (it is the region of the planet where the gap between rich and poor is the greatest), combined with the need to provide different sectors with access to connectivity. The region shows a direct correlation between said socioeconomic fracture and the gaps that can be identified in terms of connectivity, access, coverage, and affordability of ICT services (Becerra & Mastrini, 2017).

Based on studies that reveal the uneven impact of the digital revolution enabled by the dissemination of ICT convergence, as discussed by García Canclini (2004) and Castells (2009), among others, digital and communicational gaps cannot be approached in isolation, without considering the structural inequality of societies that contain them. As Jan van Dijk (2005) points out, the distribution of technological resources that underpins the concept of "digital divide" creates various forms of unequal access, through the mechanisms of social exclusion, exploitation and control.

The "digital divide" is a concept that, at the time it was coined, alluded to the difference between those who had access to the Internet and those who did not. Over time, the notion became more complex, as the commoditization of mobile connectivity technologies and the gradual growth in fixed access modes made evident that in fact there are, among those who access connectivity, many forms of access. Van Dijk (2005) puts forth the thesis that the digital divide deepens as it stops widening, that is, once most of society statistically reaches material access to an (uneven) range of info-communicational goods and services –e.g., having a mobile device-, the disparities in use, in the ways of accessing a segmented service offer, and in the acquisition and build out of capabilities and abilities, become deeper.

Even when telecommunications public policies in Latin America have suffered great challenges, they did not change much when it comes to digital divides after the 1990s, when almost all countries privatized their telecommunications sector, and new infrastructures and services were located in the main cities (Andrés et al., 2007). Public policies did not change the objective of providing good services to the upper and upper middle social classes, which has relegated the rest of the population to the condition of a minimal or lack of access (Becerra & Mastrini, 2017). Therefore, the path dependence on the conceptual framework of privatizations persists in the regulatory field.

3 Connectivity Landscape in Latin America

Regarding access to information and communication goods and services as the main variable of analysis for this work, four subsets can be identified across Latin American countries, in relative terms: first, Argentina, Chile and Uruguay have a record of higher levels of social access to media and cultural industries and telecommunications compared to the regional average. Second, Colombia, Venezuela and Peru, although with lower access indicators than the above mentioned Southern Cone countries, are also positioned above the regional average. Third, Brazil and Mexico, the two giants in terms of their respective populations and the scale of their markets, despite their strength in absolute terms, are slightly below the Latin American average in per capita access. Fourth, Ecuador, Paraguay, Bolivia, and Central America and the Caribbean (with the exception of Costa Rica, whose indicators resemble those of the Southern Cone) lag behind in social access to cultural activities, with levels well below the regional average.

On average, during the first quarter of 2021, the countries in the region as a whole reported an internet penetration rate of 75.6% according to Internet World Stats; that is, above the world penetration average of 65.6%, outperforming the Middle East, Oceania/ Australia, Asia and Africa regions (see Fig. 3.1).

However, these numbers show, on the one hand, that a significant portion of the population in Latin America and the Caribbean has no connection and, on the other, that a more thorough understanding should be sought regarding what type of connection that 75.6% of the population have. In 2021, the aggregate population of all countries in the region stood at 659 million inhabitants (8.4% of the world population). This implies that, towards the end of March 2021, some 498 million people were internet users, albeit with major disparities in terms of connectivity quality, speed and frequency of use. However, there were 161 million inhabitants disconnected.

Although internet penetration rates have been increasing over the past few years, they are still far from reaching figures comparable to those of North American and European countries. In Argentina, Brazil, Chile, Colombia and Mexico, Internet users have increased more than 90% between 2010 and 2020, as shown in Fig. 3.2.

However, a comparison between internet users and fixed broadband subscriptions in each country, reveals an unequal access to information
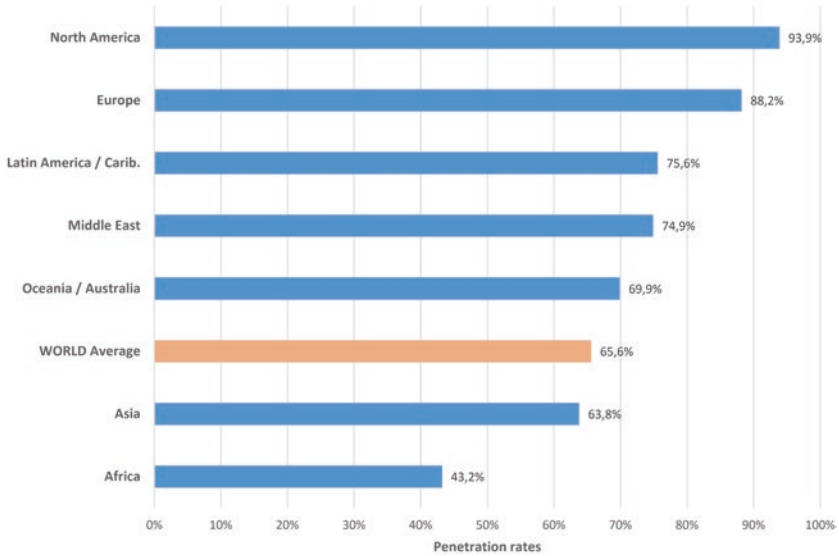
Fig. 3.1 Internet World Penetration by Regions – 2021 Q1. (Source: Own analysis, with data from Internet World Stats)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Argentina	7,04	9,78	10,8	11,9	16,0	17,7	20,9	25,9	28,1	34,0	45,0	51,0	55,8	59,9	64,7	68,0	71,0	74,3	77,7	79,9	85,5
Brazil	2,87	4,53	9,15	13,2	19,0	21,0	28,1	30,8	33,8	39,2	40,7	45,7	48,6	51,0	54,6	58,3	60,9	67,5	70,4	73,9	81,3
Chile	16,6	19,1	22,1	25,4	28,1	31,1	34,5	35,9	37,3	41,5	45,0	52,2	55,1	58,0	61,1	76,6	83,6	82,3	84,9	86,1	88,3
Colombia	2,21	2,85	4,60	7,39	9,12	11,0	15,3	21,8	25,6	30,0	36,5	40,4	49,0	51,7	52,6	55,9	58,1	62,3	64,1	65,0	69,8
Mexico	5,08	7,04	11,9	12,9	14,1	17,2	19,5	20,8	21,7	26,3	31,1	37,2	39,8	43,5	44,4	57,4	59,5	63,9	65,8	70,1	72,0

Fig. 3.2 Percentage of individuals using the internet by country (2010–2020). (Source: Own analysis, with data from ITU, World Telecommunications Indicators Database, 2021)

and communication technologies within these countries. In the five cases analyzed, less than 22% of the inhabitants have a fixed broadband subscription (see Fig. 3.3). These statistics are particularly disturbing in a pandemic context, when people are most in need of access to the internet at home for educational, health, social and working purposes.

Despite the increase in the rate of digital technology usage, inequalities arising from the disparity in digital access persist among the countries of the region. While in 2020 more than 80% of the population had an active mobile subscription in Brazil, Chile Costa Rica and Uruguay, and between 60% and 80% in Argentina, Colombia, Mexico, Paraguay and Peru; that figure did not reach 50% in Belize, Cuba, Honduras and Venezuela, and fell below 30% in Guatemala and Haiti.

Furthermore, there are major gaps in terms of connectivity quality and data download speeds, both via fixed and mobile broadband. Within Latin American countries, Chile led the ranking in terms of average data download speed over fixed broadband in June 2020 (108 Mbps), followed by
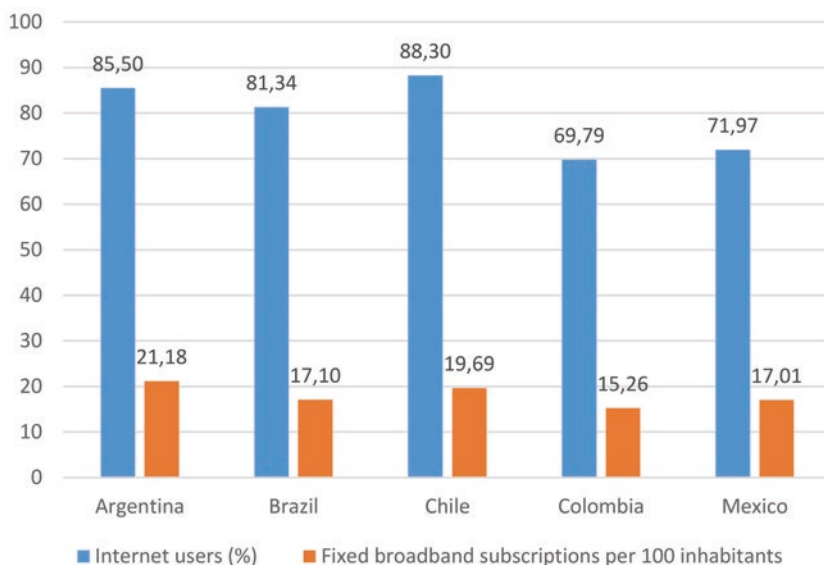
Fig. 3.3 Internet users and fixed broadband subscriptions in the selected countries (2020). (Source: Own analysis with data from ITU, World Telecommunications Indicators Database, 2021)
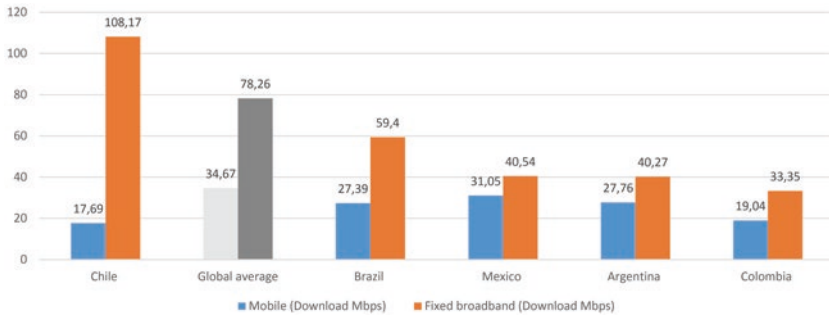
Fig. 3.4 Fixed and Mobile Broadband Data Download Speeds (June 2020). (Source: Own analysis, with data from Speedtest.net)

Panama (90.9 Mbps). However, they were the only two countries in the region above the world average (78.3 Mbps). The rest of the countries reported download speeds that were well below the average as shown in Fig. 3.4.

It should be noted that the data download speed via mobile connectivity exceeded in June 2020 that of fixed broadband in several countries (Venezuela, Cuba, Guatemala, Nicaragua, El Salvador, Honduras, Bolivia and Jamaica). These are, in general, the poorest countries in the region, probably having the lowest investment in physical telecommunications network infrastructure. It is interesting to note that no Latin American country exceeds the world average for data download speed through mobile connectivity (34.67 Mbps).

4   Public Actions for Connectivity to Face the Pandemic

In the field of telecommunications, Latin American governments' implemented several strategies to avoid the collapse of networks and to facilitate a range of remote activities as the pandemic emerged. This study addresses the public actions for connectivity implemented in Argentina, Brazil, Chile, Colombia and Mexico around four variables:

1. Access and continuity of connectivity services, including pricing of different subscription plans

2. Traffic, data consumption and content, which involves some kind of policy effort to address skills and usage digital divides
3. Infrastructure, network management and radio spectrum
4. Compensations for telecommunications companies

4.1   Access and Continuity of Connectivity Services

In several countries, measures were adopted to ensure the continuity of access to connectivity services and the continuity of ICT services (fixed and mobile telephony, and internet). These initiatives have included the declaration of these services as essential or fundamental, the establishment of minimum connectivity commitments, the prohibition of discontinuing services due to non-payment, and/or the freezing of prices during the period of mandatory social isolation.

In Argentina, the government ordered by decree[1] the prohibition of cancelling or discontinuing due to non-payment the services of fixed or mobile telephony, Internet and cable TV, by radio-electric or satellite link, for users of disadvantaged sectors (recipients of social assistance, retirees and pensioners, low-income workers, beneficiaries of unemployment insurance, among others), and for small and medium-sized companies, labor cooperatives, healthcare institutions and certain public welfare entities. Telecommunication service providers were also required to provide a reduced service that guaranteed connectivity for users with a prepaid mobile phone or Internet service system, without paying a surcharge to enable consumption. This measure was successively extended during the quarantine.

In addition, new price increases for mobile and fixed telephony, Internet and pay television services were barred until August 31, 2020, a measure that was later extended by decree until the end of the year.[2] So-called "inclusive plans" were introduced for fixed and mobile telephony and internet services, in both postpaid and prepaid modalities, for a fixed price agreed with the companies until September 30. The objective of this measure was to enable people facing economic hardship during the

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[1] Decree No. 311/2020, 03/24/2020, https://www.boletinoficial.gob.ar/detalleAviso/primera/227120/20200325.
[2] Decree No. 690/2020, 09/21/2020, https://www.boletinoficial.gob.ar/detalleAviso/primera/233932/20200822.

pandemic to have the possibility of changing their plan and accessing a connectivity service at an affordable price (ENaCom, 2020b).

In Brazil, a decree[3] declared that telecommunications and the Internet qualify as a public service and are considered essential, as are medical and hospital services, social assistance, public security, and national law-enforcement and civil defense, among other activities. Thus, the continued provision of these activities must be guaranteed as they are essential to meet the needs of the community.

Likewise, the National Telecommunications Agency (ANATEL) signed a public commitment with various associations and companies in the industry in which they agreed on measures to "keep Brazil connected". This commitment includes ensuring the continuity of telecommunications services; giving priority in terms of connectivity to agencies that provide public health and safety services; considering the difficulties that consumers may have in meeting their bill payments; and the sending, by the providers, of alert messages and information to the population as requested by the authorities (ANATEL, 2020a). A crisis committee made up of all the signatories was also created to permanently evaluate the capacity of telecommunications networks and to adopt, if necessary, new measures or emergency solutions.

In Chile, the Under Secretariat of Telecommunications (SUBTEL) asked telecommunication companies (Claro, Entel, GTD, Movistar, Mundo Pacífico, VTR and Wom) in March to issue reports on the behavior of their networks and share their contingency plans for managing of the expected increase in traffic during the crisis caused by COVID-19. Although some companies pointed out that at the beginning of the pandemic it was not possible to foresee the behavior of users in a situation of exceptionality (ENTEL, 2020), the majority estimated that the networks would respond correctly and that the expected increase in traffic was within a tolerable range. Thus, for example, Claro pointed out that its networks had not shown "any type of saturation or contingency that warrant reporting any problem in the provision of our services or any impact on traffic management" (CLARO, 2020). Other companies suggested that the State introduce more flexibility in the regulation about network neutrality during the emergency period, so that they could prioritize

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[3] Decree No. 10.282, 03/20/2020, http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/decreto/D10282.htm.

traffic and assign preference to voice calls, communication and teleworking tools, and access to health and educational information websites (GTD, 2020).

In May, after quarantine was decreed in 38 communes in the Metropolitan Region –where more than eight million inhabitants live–, SUBTEL reiterated the request for reports from telecommunications companies, including on this occasion the companies CMET and DirecTV, in order to monitor traffic behavior compared to what had been reported to date (SUBTEL, 2020a).

Furthermore, the Ministry of Transport and Telecommunications of Chile agreed with the companies in the industry to implement a three-month "Solidarity Connectivity Plan". The program was designed to ensure that the economically most vulnerable sectors do not lose access to the network if they cannot afford the subscription they had signed up for. Thus, the companies agreed to provide minimum browsing speeds through fixed internet (2 Mbps broadband speed) and mobile connectivity (256 Kbps data speed), as well as text messages (50 SMS) and voice calls (300 minutes), at the request of users (SUBTEL, 2020b, d). The measure came into effect in April and when the quarantine was extended, it was also extended. According to the Under Secretary of Telecommunications, about 11 million users with prepaid and postpaid plans joined the solidarity plan in less than two months. It is important to note that the plan is for users who were already customers of each company, that is, it only benefits those sectors that already had some type of connectivity at the beginning of the pandemic.

In Colombia, telecommunication services were also declared essential public services (along with broadcasting, television and postal services), and therefore a prohibition to discontinue the provision of said services was enacted, during the state of "economic, social and ecological emergency" decreed by the government.[4] Likewise, measures were established for users with mobile phone plans, both prepaid and postpaid, in order to guarantee minimum of connectivity for them (SMS and data) in case of late payment or non-payment of their subscriptions.

In Mexico, the Federal Telecommunications Institute (IFT), in line with the measures introduced by the national government, issued a statement specifying that telecommunications companies, as providers of a

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[4] Decree No. 424, 03/23/2020, https://www.mintic.gov.co/portal/604/articles-126323_decreto_464_23_marzo2020.pdf.

public service, were eligible for the necessary exceptions to carry out their tasks during the pandemic, in order to guarantee the continuity of services (IFT, 2020c). In addition, the IFT entered into some agreements with telecommunications companies, although they came later than those of other countries, and were not as comprehensive. It was not until the end of April that an agreement was reached with some internet and fixed telephone carriers (izzi, Megacable, Telmex, Totalplay and Maxcom) to offer customers the option of temporarily migrating to a low-cost plan (MXN $ 100, around US$ 5). The conditions to qualify were rather stringent: they had to be active subscribers with a fixed residential internet access contract, be current on their payments as of April 30, 2020, migrate once to the "contingency support" package during May and remain in it until June 30, after which they were required to return to the originally contracted plan. The package included internet access with a browsing speed of up to 2 Mbps, but it did not allow video or video games (IFT, 2020e).

Agreements were also made with certain Virtual Mobile Operators, with small licensees of public networks grouped in the Independent Telecommunications Association (ATIM), and with the satellite services operator Hughes, for the provision of certain low-cost connectivity services and/or minimal access, to ease the economic burden of subscribers during the pandemic (IFT, 2020a).

4.2   *Traffic, Data Consumption and Content*

Following the enactment of mandatory social distancing measures, an increase in internet traffic occurred in all countries. Although the rising trend in fact preceded the pandemic, some more pronounced peaks and variations have been observed since March 2020.

In the case of Argentina, there was a 35% growth in traffic during March and April, after the start of the lockdown on March 20, compared to the average traffic in February. However, a comparison of April 2020 data against the same month of 2019 reveals an increase of 65% (CABASE, 2020). State-run company ArSat, which manages the largest fiber optic backbone in the country, reported that wholesale traffic increased by 40% during the first four months of the sanitary emergency.

Brazil has an average aggregate traffic of around 7.15 Tbps, but in mid-March it reached peaks of up to 10 and 11 Tbps, according to data from the Internet Steering Committee (IX.br, 2020). While traffic reported an

upward curve with 60% increases compared to the previous year, the peaks in March coincide with the beginning of the quarantine, particularly in the State of Sao Paulo, the largest in the country.

In Chile, total fixed and mobile traffic escalated by 40% in March 2020, driven by the pandemic, compared to the same period in 2019 (SUBTEL, 2020c). In the case of Colombia, total Internet traffic increased by 37.62% during March compared to February, and by 25.1% compared to January, according to reports from the Communications Regulation Commission (CRC, 2020). In Mexico, traffic also began to mount in late March, with peaks that exceeded 15Gb/s, according to data from MDC Data Center's MEX-IX internet exchange point, located on the border between the United States and Mexico (Hernández, 2020).

In this landscape, the authorities of each country implemented measures to prevent their networks from collapsing, and for that purpose they made agreements with the industry. In some cases, the companies came up with their own initiatives. Efforts included commitments by content providers to lower the quality of audiovisual services, initiatives to release "premium" signals or content for no extra charge to existing subscribers, and zero-rating agreements with telecommunication carriers.

Agreements with over-the-top (OTT) content providers to lower the quality of streaming audiovisual services followed the experience of the European Union, which had asked companies such as Netflix, Amazon Prime Video and YouTube to reduce transmission quality on their platforms to help cope with increased traffic and ensure an efficient use of telecom networks.

In Argentina, ENaCom agreed with Netflix to reduce transmission bitrates for a period of 30 days, in order to reduce the bandwidth used by 25%, without compromising the resolution included in the plans hired by users. The same happened in Chile, in line with the Netflix policy at the regional level. The initiative was followed by YouTube, which temporarily reduced the image quality of its videos worldwide to standard definition, to lessen the burden on internet traffic.

In Brazil, Globo Group decided to reduce the quality of the content offered on its Globoplay platform, eliminating the replay of videos in Full HD and 4 K (1080 pixels), while allowing replays in high definition (720 pixels). This measure included the conglomerate's news and entertainment portals (G1, Globo Esporte and GShow) ('O que o Governo está Fazendo para evitar o Colapso da Internet', 2020).

In Colombia, a decree[5] in late March determined that over-the-top video-on-demand services should prioritize streaming their content in standard definition format. For its part, the Mexican regulatory body merely disseminated, at the beginning of the pandemic, informative materials on the responsible use of networks, with recommendations to prevent saturation in the event of a surge in the use of online services, content and applications. Among the main recommendations were to "prioritize the use of the internet for informative, work, education and health-related purposes", "limit the use of videoconferences", preferably use "the landline over the cell phone when at home", use time bands with less data traffic to "watch movies, series and videos, or play online" (IFT, 2020b).

In addition to the reduction in video quality, several pay TV operators in the region opted to release certain content on demand and some "premium" signals at no additional cost to their customers. This strategy was adopted by the Telecom-Cablevisión in Argentina; by Net, Claro, Sky, Oi and Vivo in Brazil; by Movistar in Chile; and by DirecTV at regional level (Hernández, 2020).

A policy that was replicated in all countries was the establishment of zero-rating agreements with telecommunication carriers, enabling citizens to access official information and educational sites from mobile apps, without this being counted as consumption of data in their subscription plans. In most cases, these schemes enabled access to official information and health websites, and to educational portals.

In Argentina, an agreement was reached with the mobile phone carriers to provide free access to use the Cuid.ar health app and the platform of the Ministry of Education for primary and secondary education after schools were closed for face-to-face classes.[6] In April the agreement was extended to facilitate access for university students to the platforms of national universities (ENaCom, 2020a). However, the widespread use of proprietary applications and platforms throughout the educational system is not within the scope of this free access, and this has hindered the delivery of virtual classes due to the pandemic for students and teachers in low-income sectors.

In Brazil, the public connectivity commitment signed between ANATEL and the telecommunications providers included free access to

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[5] Article 4 of Decree 464, 03/23/2020, https://www.mintic.gov.co/portal/604/articles-126323_decreto_464_23_marzo2020.pdf.

[6] The "Seguimos Educando" platform is available at https://www.educ.ar.

the Coronavirus application, developed by the Ministry of Health. As part of the implementation of the "Solidarity Connectivity Plan", the Chilean government agreed with companies that mobile phone users, in plans with or without a contract, would access certain social media platforms and official sites on health, education and social programs and benefits, waiving data consumption fees.[7]

In Colombia, mobile phone customers with postpaid plans can also access contents and applications related to the health emergency, including 20 URL addresses without consuming their data credit balance.[8] At these websites, citizens can consult official, labor and educational information, as well as health topics related to COVID-19; access telecommunications and television services; among other applications.[9]

In Mexico, the government agreed with mobile carriers to enable users to access, during the period of the health emergency, official informative content on the novel coronavirus without consuming data on their balance (IFT, 2020b).[10] Likewise, it was decided that mobile phone users would be able to receive free text messages (SMS) from the sender GOBMX, with relevant information about the pandemic.

In addition to the introduction of zero-rating for some services, platforms or applications, the principle of network neutrality was relaxed in the countries under review, by enabling measures of temporary traffic management. For companies and the business chambers they belong to, such as the Inter-American Association of Telecommunications Companies (ASIET), the response of the networks to greater demand from users had to do with traffic management strategies by type of service (not by provider), in particular, the reduction of the volume of data consumed by audiovisual content.

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[7] In Chile, zero-rating websites are: www.registrosocial.gob.cl, https://www.ingresodeemergencia.cl/, https://www.gob.cl/coronavirus/ and **https://www.curriculumnacional.cl/estudiantes/Ingreso**

[8] MinTIC Resolution No. 639, 04/01/2020, https://www.mintic.gov.co/portal/604/articles-126471_res_639.pdf.

[9] The websites within the scope of this agreement are: https://www.minsalud.gov.co/Paginas/default.asp, http://aprende.colombiaaprende.edu.co/cainicio, https://www.mininterior.gov.co/, https://www.mintic.gov.co/portal/inicio/, https://maguare.gov.co/http://www.mintrabajo.gov.co/web/guest/inicio, together with specific websites about coronavirus: https://www.ins.gov.co/Noticias/Paginas/Coronavirus.aspx; https://coronaviruscolombia.gov.co/Covid19/index.html.

[10] Zero-rating access is allowed in https://coronavirus.gob.mx.

4.3   *Infrastructure, Network Management and Radio Spectrum*

Throughout the first 4 months during which COVID-19 spread in Latin America, governments focused primarily on implementing measures to ensure the continued operation of networks and to guarantee a minimum level of services. Although the digital divide between different regions of each country became evident, particularly in those places without access to any type of connectivity, in this period initiatives aimed at implementing long-term infrastructure plans were not a priority.

The main mobile carriers in the region have explicitly and repeatedly requested governments to expand and accelerate the granting of licenses in spectrum bands, to extend the terms of current services, to grant certain segments for temporary testing, and to eliminate "bureaucratic barriers and restrictions on immediate access to more spectrum" (GSMA, 2020). The recommendations of the ECLAC and of the Organization of American States (OAS)'s Inter-American Telecommunications Commission (CITEL) followed along the same lines. However, in general, the implementation of this course of action was not a priority in the countries under analysis in the period under review.

In Latin America, only Panama, Peru and Ecuador enabled the allocation of radio spectrum on a temporary and free basis. The fact that the countries included in this analysis have succeeded in managing their networks to cope with the spikes of demand during the pandemic reveals that there are other concerns of certain large operators (e.g., savings in network densification) behind the demand for granting temporary spectrum, which are not essential in current conditions.

To supplement the above-mentioned actions, in Argentina a cooperation and reciprocal support agreement was signed in terms of network capacity by the regulator, the state-owned telecommunications company ArSat, and the four wholesale incumbent companies in the country (Telecom, Telefónica, América Móvil and Silica Networks). The agreement was aimed at leveraging the existing infrastructure of the main providers nationwide, which is linked with local connectivity service operators (SMEs and cooperatives) throughout the country for the deployment of last-mile networks.

With a longer-term vision, a new "General Regulation of Universal Service" was promulgated in June, specifying the contributions, in the form of investments, that ICT service providers must make on a monthly basis (1% of total net income from the provision of ICT services), as well

as the guidelines that programs and projects in this area should observe in order to reduce the digital divide.

In Mexico, the Federal Telecommunications Institute announced at the beginning of the pandemic that they would analyze the possibility of temporarily delivering more spectrum frequencies to respond to the growing demand for traffic, although this did not materialize. Regarding infrastructure, the national government issued a statement in support of state and municipal authorities to grant permits and authorizations for the installation, operation and maintenance of telecommunications and broadcasting infrastructure for entities providing such services during the health contingency period (IFT, 2020d).

4.4   Compensations for Telecommunication Companies

In consideration of the agreements and commitments signed between the governments and the telecommunication companies, the latter received some benefits and compensations.

In Argentina, ENaCom suspended a series of administrative procedures, and extended, on an exceptional basis, the term of validity for permits, authorizations, registrations, filings and licenses with expiration dates from March 16 to September 17, 2020.[11] In Brazil, the National Telecommunications Agency deferred the enforcement of fines, liabilities and penalties for late payment by telecommunication companies that were scheduled to expire between March 20 and April 10, 2020.[12] Additionally, the deadline for the payment of taxes on the provision of telecommunications services was extended until August 31, 2020 (versus the original expiration date scheduled for March 2020).[13] The objective was to alleviate the stress on the companies' cash flow and ensure the provision of services in a context that anticipated a rise in subscriber delinquency. Certification processes for telecommunication equipment were also simplified, and companies were asked only to provide the manufacturer's

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[11] ENACOM Resolution No. 326/2020, extended by Resolution No. 771/2020, 07/23/2020 http://servicios.infoleg.gob.ar/infolegInternet/anexos/335000-339999/336042/texact.htm.

[12] ANATEL, Resolution No. 8/2020/SAF, 03/31/2020 https://sei.anatel.gov.br/sei/publicacoes/controlador_publicacoes.php?acao=publicacao_visualizar&id_documento=6124827&id_orgao_publicacao=0.

[13] Provisional Measure No. 952, 04/15/2020, http://www.planalto.gov.br/ccivil_03/_Ato2019-2022/2020/Mpv/mpv952impressao.htm.

declaration and were exempted from submitting other types of documentation for products with a valid certificate between March 6 and June 30 (ANATEL, 2020b).

In Colombia, the government deferred the companies' deadlines for paying fees for concessions, licenses, permits, authorizations and approvals for the provision of telecommunications networks and postal services until May 30, including contributions to the universal service fund (Single ICT Fund).[14] The Ministry of Information and Communication Technologies issued the amended payment schedule at the end of March, since there was no waiver of fees but a temporary extension granted in the context of the pandemic.

Similar measures were also taken in Mexico, where the IFT postponed calculation of the terms and deadlines of administrative procedures and economic competition for telecommunications and broadcasting services, with some exceptions for procedures that could be carried out electronically. The measure, first introduced in late March, was then extended throughout the period of the health emergency and until the IFT plenary session issues an agreement for the resumption of the calculation of terms (IFT, 2020f).

5   CONCLUSIONS

The comparative study carried out in this work offers some conclusions in order to provide insights on telecommunications policies in the context of pandemic emergence in Latin America.

In the first months of the coronavirus spread, governments in the region developed a battery of public policies, mostly in agreement with large private operators, although there were exceptions. The policies carried out in Argentina, Chile, Colombia, Brazil and Mexico revealed similarities in the fact that they were all aimed at sustaining the networks in the face of growing traffic and data consumption demand, providing access and continuity of connectivity services for customers of telecommunications companies with a lower payment capacity. In other words, public policies were orientated not only to maintain the existing connectivity levels prior to March 2020, but also to support and develop skills and opportunities for social use of ICT through the establishment of zero-rating agreements with telecommunication carriers to enable people's

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[14] Article 5 of Decree No. 464 of 2020.

access to official information, education and health services applications. These measures were supplemented by some decisions made by the industry, in some cases requested by governments, to reduce the bitrate of on-demand audiovisual content and to manage network traffic, putting network neutrality principles on hiatus; together with the release of "premium" contents for no extra charge to existing subscribers.

As a counterbalance, telecommunication companies operating in the five countries we have analyzed received some compensations. These benefits ranged from the suspension of deadlines to compel with administrative procedures (e.g. terms of validity for permits, authorizations, licenses), to the deferment of the enforcement of fines, liabilities or tax payments, depending on the country. However, despite the claim coming mainly from mobile operators and telecommunication associations, none of these governments acceded to accelerate the granting of licenses in spectrum bands in the course of the pandemic emergence (March–June 2020).

During the analyzed period, the actions deployed shaped policies that were defensive in nature, that is, governments focused their efforts on preventing the levels of connectivity, ICT consumption and usage prior to March from suffering significant deterioration due to the emergency. This gave the sector a certain stability in terms of fixed and mobile connections, fundamentally in underserved segments, which are the majority in a region where large portions of the population are at poverty levels. For the same defensive reason, initiatives focused on long-term infrastructure plans were not a priority during the analyzed period.

As a result of this study, it is clear that, even in the context of the pandemic, public policies in telecommunications in five of the biggest Latin American countries show the inertia of the private orientation of the sector, the evidence of which is the lack of measures to repair the serious gaps in ICT access, skills and usages. This inertia (path dependence) was more evident in the two largest markets, Brazil and Mexico, whose measures to avoid increases in telecommunications services and to generate inclusion were more timid than in the other three cases surveyed: Argentina, Chile and Colombia.

Nevertheless, mainly in Argentina, Chile and Colombia some measures of an extraordinary nature, such as ensuring the continuity of services in cases of late payment or non-payment, were to be extended in subsequent months. And the special consideration given to the impact of the health and economic crisis introduced by the pandemic on the most vulnerable segments may become a platform for future policy-making in the field of

telecommunications. In this regard, in the period after the scope of this study, the Argentine government issued a decree (DNU 690/2020) that declared ICT activities "public services in competence", created mandatory universal basic plans and empowered the State to authorize price increases, while in the Congresses of Chile and Colombia initiatives advanced to declare as "public services" some resources such as fixed connectivity for home internet.

These latest policies are aimed at addressing one of the aspects that the first exceptional actions did not take into consideration, i.e., the population without access to ICT services and in particular, to fixed or mobile connectivity. For both socioeconomic and geographical reasons, vast social sectors in Latin America are out of coverage or find basic services unaffordable, a circumstance that already existed prior to the pandemic and that will be aggravated by its economic consequences. While digital gaps in terms of material access to network connections and devices are well known, skills and usage digital divides also conditioned ICT connectivity during the pandemic.

The unequal structuring of Latin American societies shows a direct correlation with the materialization of access to ICTs and with the types of access to these technologies. This correlation makes it possible to weigh the relative incidence of sectoral policies and the importance of macroeconomic policies, which have an impact on the income and quality of life of society and, consequently, on the type of access to services necessary for its well-being, such as telecommunications and connectivity services.

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Connecting Scotland: Delivering Digital Inclusion at Scale

Rory Brown, Aaron Slater, and Irene Warner-Mackintosh

1   Connecting Scotland: An Introduction

Connecting Scotland was set up in May 2020 in response to the COVID-19 pandemic and provides a national, human-centred, consistent, and comprehensive approach to reducing the rates of digital exclusion and digital marginalisation due to low income.[1] It is a collaboration between public, private and third sector organisations, with Scottish Council for Voluntary Organisations and Scottish Government working together as the leads.

The programme provides devices, data, and person-centred support to those facing highest risk of digital exclusion, and further impacted by the

[1] https://storage.googleapis.com/scvo-cms/wp-content/uploads/2021/09/DIG_Connecting-Scot_Impact-Report_Aug2021_Final.pdf.

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COVID-19 pandemic and subsequent lockdown. It utilises a 'Digital Champion' model: staff and volunteers across Scotland who have trusted relationships with end recipients are trained to provide holistic ongoing support in the digital space, focused on building foundation and essential digital skills, confidence, and digital understanding.

In its first twelve months, Connecting Scotland supported 1047 organisations which delivered 4917 projects. In total, 30,462 Chromebooks, 29,697 iPads and 51,021 MiFi Devices were issued to households across Scotland. The project continues to deliver this work at scale.

> This programme has provided a vital lifeline for many people by helping families maintain virtual contact and allowing users to access public, health and employment services that were only available online as a result of Covid. Kate Forbes, Economy Secretary.

1.1   *Digital Inequality in Scotland in 2020*

Prior to the pandemic, digital participation was an identified key priority of Scottish Government, with the strategic approach outlined in Realising Scotland's Full Potential in a Digital World. Much had been achieved since the adoption of this strategy, including a co-ordinated partnership approach to addressing digital exclusion, led by the Scottish Council for Voluntary Organisations (SCVO); the introduction of a Digital Charter; funding streams for the direct delivery of meaningful work to address digital inequality, as well as significant advances in infrastructure and the provision of high-speed broadband, covering a significant portion of Scotland's challenging landscape.

Nevertheless, there continued to be challenges and many remained offline. Research in the field identified key demographics of people less likely to have essential digital skills, or indeed those who were completely offline. These groups included older adults; people with a disability; people experiencing poverty; people not in employment, education or training and also children and young people living in those households that were struggling financially. (*Lloyds Bank Consumer Digital Index* 2019, 2019) Additionally, young people who were care experienced were also identified as being likely to be impacted by digital inequality. Furthermore, those living in hyper rural areas, not yet served by connectivity also brought a particular challenge. (Philip et al., 2017).

COVID-19, necessitated urgent and immediate change, as all aspects of community were moved into the online space, a space which provided a necessary lifeline for citizens to access health and wellbeing services, education, employment, financial support, connection with loved ones and much more. For those offline, without digital skills, connectivity or access to devices, the impact of digital inequality suddenly became a matter of life or death. (Arakpogun et al., 2020; Buchholz et al., 2020; Khilnani et al., 2020).

2   Origins: Call to Action and Mobilisation Up to the Point of Agreeing the Pilot

Scotland's response to the exacerbation of digital exclusion during a national lockdown started with a 'Call to Action'[2] (No One Left Behind Digital Scotland: COVID-19). Initiated by the Chief Designer at Scottish Government, both SCVO[3] and ScotlandIS[4] published the Call to Action on 19 March 2020 to engage with and mobilise their respective sectors, following an initial meeting on 18 March. This Call to Action defined the 'problem':

> Digital connectivity will quickly become a lifeline for our most vulnerable people in the COVID-19 emergency. However, in the most vulnerable populations we have many people who do not have:
>
> - access to an internet enabled device and / or broadband or 4/5G
> - the ability to use them even if they do have them (significant numbers will be unable to use them or they will be sitting in a cupboard)
> - the ability to pay for access to the internet, maintain devices when they break etc.

In defining the 'problem' the Call to Action established economic and social inequality as drivers for digital exclusion, highlighting key elements

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[2] https://scvo.scot/p/36175/2020/03/19/no-one-left-behind-digital-scotland-covid-19.

[3] https://scvo.scot/p/36175/2020/03/19/no-one-left-behind-digital-scotland-covid-19.

[4] https://www.scotlandis.com/blog/no-one-left-behind-digital-scotland-covid-19-emergency/.

of a possible solution. Organisations and individuals were invited to join a national response team to:

- Find those most impacted by digital exclusion
- Get devices to them
- Provide connectivity
- Provide ongoing support to use the devices through trusted intermediaries

This approach sought to draw on research findings addressing first, second and third level digital divides, (Helsper & Reisdorf, 2017a; van Deursen & Helsper, 2015), drawing on evidence of the positive impact of person-centred holistic support for digital skills as part of wider work around social inequality (Seifert, 2020; Wagg & Simeonova, 2021) French, Quinn and Yates note that 'Digital inclusion supports better social outcomes by helping people increase their confidence, self-efficacy and resilience. Equally, digital inclusion works best when it recognises and reflects individual needs, and helps people achieve outcomes that are relevant to their lives. This research therefore underlines again the case for embedding digital inclusion in all types of social support programme, whether public, private or community sector (French et al., 2018).

The response to the Call to Action was significant, with offers of support from the voluntary, private and public sectors. This response enabled the formation of a project team, working collaboratively to establish a plan to realise the aspirations of the Call to Action. In these early days there were no financial resources committed to the programme, with everyone working on a voluntary basis. The response enabled the emergence of a programme team working across eight teams (see Table 4.1).

In the three weeks from the inception of the programme on 18 March, this team of volunteers worked to understand the scope of what a response would look like; how the questions outlined in the Call to Action could be answered with actions; and how this could be operationalized during an unprecedented national lockdown. During these three weeks, funding was secured from Scottish Government to conduct an initial pilot to test and learn and work on a minimum viable product was agreed on 8 April 2020.

Table 4.1 Connecting Scotland objectives

	Objective
Team 1	Find the people who need to be brought online
Team 2	Define what they need (device and training requirements) and develop training for citizens
Team 3	Source device and broadband and/or device access
Team 4	Set up distribution to local hubs and from there to households
Team 5	Coordinate trainers and develop and deliver training the trainers.
Team 6	Develop and maintain ongoing tech support
Team 7	Develop and maintain ongoing people support (Digital Champions etc.)
Team 8	Overall project coordination and comms

3   The Pilot, and Establishing a Minimum Viable Product (MVP)

Entering the initial pilot phase, there were many questions that needed answers, if the solution were to be delivered at scale. The initial pilot was to be limited in scope, as some parts of the process were not as developed at this stage. In particular the procurement and distribution processes. There were, however, some key issues that this pilot could explore:

- What kind of device best meets a learner's needs?
- What level of connectivity would be needed?
- How do you provide digital skills support remotely?
- How do we define and determine eligibility for the programme?

The pilot was a significant part of the design and development of the programme. Given a key driver was the need to move at pace, the pilot was a key opportunity to inform many of the decisions needed to deliver the programme at scale. The initial pilot was agreed on 8 April 2020 and ran into early May.

To help answer some of these questions, and to get maximum return from the initial pilot, a number of assumptions were made. These assumptions were defined based on existing best practice, and research in the field of digital inclusion:

- Trusted pre-existing relationships are key to developing digital skills and confidence (Wilson, 2017)

- Community organisations play a key role in enabling digital skills development (Agnew & Ripper, 2011)
- Community organisations play a key role in identifying those in most need)
- Need to understand the 'hook' at an individual level to motivate someone to develop their digital skills and confidence (French et al., 2018; Helsper & Reisdorf, 2017b; Van Dijk, 2017)

3.1   Running the Pilot

In order to move forward, a minimum viable product (MVP) was agreed, to allow for the testing of assumptions and identification of potential breaking points. The agreed MVP was tested with a Samsung Galaxy Table A, a pay-as-you-go data sim card with 15GB of data, mobile device management (MDM) through G-Suite, a lending library model for device transfer, and support being delivered by Digital Champions. By defining the MVP, we were able to establish what was and what was not within the scope of the pilot (see Table 4.2).

Two organisations were selected to be initial sites. Glasgow Disability Alliance[5] was a key organisation in the mobilization of Connecting Scotland since the first call, and it was decided that understanding the needs of learners with a range of different accessibility needs would be beneficial to the programme (See also: Chadwick et al., 2017). The second site was Govan Housing Association,[6] selected because of existing community-based partnership already undertaken around both digital and wider social inequality (and, in particular, as part of emergency Covid response), allowing the programme to test some assumptions at a quicker pace. The size of both organisations was also helpful for the pilot to explore systems and structures which could either offer opportunity or might inhibit or obstruct progress.

The criteria for user groups in the initial pilot was loosely defined as those who were identified by community-based frontline organisations as being both digitally excluded and experiencing some form of social exclusion. These broad parameters would enable the participating pilot sites to identify users quicker and enable to pilot to progress faster.

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[5] https://gda.scot/.
[6] https://www.govanha.org.uk/.

Table 4.2 Connecting Scotland scope

In scope	Not in scope
Ability of organisations to identify target groups: do community organisations have the reach and engagement with those who are digitally excluded and can they readily identify these people. Pilot organisations were given broad criteria of "digitally excluded and experiencing some form of social exclusion."	Distribution process from supplier to organisation: logistics with our procurement process were still being developed. In this pilot the devices and sims were purchased through online retailers.
Distribution from organisation to end user: what are the considerations for organisations getting devices direct to the end user? Devices and sim cards were shipped direct to the pilot sites to be 'setup' and delivered directly to end users.	Selection of participating organisations: The process for inviting organisations to take part was still under development. In this initial pilot the organisations were selected by the programme.
Capacity of organisations to provide Digital Champion support: can any organisation provide Digital Champion support and what issues might they encounter?	Gifting model: although a gifting model was the preferred option we used a lending library model in the pilot to allow for Mobile Device Management to be tested.
Digital Champions providing support remotely: can someone improve their digital skills and confidence when being supported over the telephone?	Capturing end user data: At this stage work was still underway on a database to capture end-user data, so this was not within scope.
Use of MDM: Is there a benefit to using MDM and is it scalable? Google accounts would be used on the devices, set up in advance by the pilot organisation, to bypass the device setup process, create a stripped back home screen and push relevant content and apps from reliable sources.	Contract/agreement to manage expectations between Connecting Scotland and participating organisations: the expectations of participating organisations were largely unknown at this point so a contract/agreement was not within the scope of the pilot.
Data allowance: How long will 15GB last for someone who is classified as being 'digitally excluded'?	Aftercare support: the aftercare support was linked to technical support from our supplier for delivery at scale, and as such aftercare support was out of scope for the initial pilot.

Devices and sims were ordered through online retailers, rather than through planned procurement channels, due to lead times and the need to learn at pace. The devices and sims were shipped directly to the two pilot sites. 55 Google accounts were created and allocated to the pilot sites,

who then undertook a setup process. This involved unboxing the device, inserting the data sim, setting up the Google account, and then sanitizing the devices and re-packaging them. The sites then delivered devices to the doorsteps of their identified eligible recipients. The intention of this device set-up was to minimise the impact of some of the initial barriers, such as "it's too complicated" (French et al., 2018).

3.2   *Digital Skills Support*

Building on both academic research and existing models of work in the third sector in Scotland, the pilot used a digital champion model to support learners. (Wilson, Grant and Carnegie United Kingdom Trust, 2017; French et al., 2018) The role of the 'trusted intermediary' or 'digital champion' is a holistic, person-centred approach which sets digital inclusion in the context of wider support work. Frontline staff are upskilled to become Digital Champions, and in particular to understand the impact of digital inequality on those receiving support, and digital inclusion activity is consequently embedded in core service delivery. This leads to greater sustainability, with digital inclusion becoming part of everyday support. A further benefit of this approach is the pre-existing trusted relationships between the learner and the digital champion who is offering practical and meaningful support in a context far greater than solely in the digital domain.

In order to upskill frontline staff to become Digital Champions, a two-hour remote Digital Champion training session was provided over Zoom. At the time of the pilot there was an understanding that remote training was the only option available due to lockdown restrictions and delivering this at scale would require consideration as to what Digital Champions could expect from this training. The purpose of the training was therefore framed as introducing the role of a Digital Champion and sharing best practice for remote support delivery. There was a recognition that more detailed input would have to be provided through supporting open-source resources. Training was provided by Mhor Collective[7] during the pilot, and subsequently throughout the duration of Connecting Scotland.

Despite the delivery method and time limitations of the training, insights from digital champions were particularly helpful. Participant

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[7] https://www.mhorcollective.com/.

feedback evidenced that all had gained useful understanding of the impact of digital inequality during the pandemic and understood the role and potential impact of the trusted intermediary acting as digital champion. Participants were also particularly positive about the range of open-source resources, particularly for those new to the internet, which were shared during training, reflecting that these would be useful in their support roles.

Govan Housing Association delivered support through their staff and partner agency staff. This was a 'clean sweep' at the digital champion model, meaning that key frontline staff engaged directly with device recipients during periods of wider support. With the Glasgow Disability Alliance cohort, the project departed slightly from the embedded digital champion model and Mhor Collective acted as the digital skills support for the first few calls, before handing over to Glasgow Disability Alliance's own staff to continue support as embedded digital champions. This was to enable an element of co-production both to inform future training and support, and to ensure that those developing the training better understood some of the challenges around remote support for individuals with accessibility needs.

4   Key Lessons

4.1   Lessons from the Pilot

Identifying Target Groups
The pilot provided proof of concept that community-based organisations were best placed to identify people who meet the eligibility criteria. As lockdown restrictions came into force, Glasgow Disability Alliance had undertaken a wide-reaching survey with their members to understand the impact of restrictions and subsequent support needs, which included digital inclusion needs. Govan Housing Association engaged with partner agencies locally to help reach those who were offline; focusing on tenants who were self-isolating, those who lost their job during the pandemic and New Scots (refugees and asylum seekers recently arrived in Scotland).

Distribution from Organisation to End User
The setup process for the pilot organisations was time-consuming and logistically challenging. Each device was unboxed, the data sim was

installed, a Google account was registered, and the device was sanitized and repackaged to be distributed to the end user. Glasgow Disability Alliance included an additional step in their setup process, configuring accessibility settings for their users, based on their needs, in advance of distribution. The most commonly used accessibility settings were high contrast keyboards, larger font sizes, magnifier, and increasing time before lock-screen activates.

The setup process flagged logistical difficulties that would prove to be a significant challenge when delivering at scale. There were challenges around the data sim not connecting, which required the pilot organisation to change the Access Point Network (APN) settings on the device. The devices needed to be charged as they were being setup, and as the majority of services were working from home this meant staff using limited sockets to charge and setup a couple of devices at a time. They also discovered that during the initial setup process required installation of system updates, which would use around 1GB of data from the data sim if the devices weren't connected to home Wi-Fi.

> Two thoughts for people who are setting up these devices in their own homes during lockdown. Charging 15 devices can be a logistical challenge. I had a number of USB port plugs (3 USB ports in one 3-point plug) but even then I could only charge 6 at a time given the space. Digital Lead at Glasgow Disability Alliance

The desire to provide a seamless out-of-box experience for end users would need to be balanced against the ability of participating organisations to deliver devices at scale, and not exclude organisations that would have limited capacity and technical knowledge to be able to complete the device setup process and deliver devices at speed.

Capacity of Organisations to Provide Digital Champion Support
The two pilot sites had different experiences in relation to their capacity to provide Digital Champion support. For Govan Housing Association, the Digital Champion approach was a familiar model already being utilized. Glasgow Disability Alliance were new to this approach and capacity to support such a large number of members was a concern. Too meet the need for skills support, Glasgow Disability Alliance formed a partnership with Glasgow Life, an organisation delivering cultural, sporting and

learning activities on behalf of Glasgow City Council. Glasgow Life was then able to provide digital champions through their own work. This raised two key considerations for the programme:

1. A clear onboarding process would need to set out the role of organisations in relation to Digital Champion support, clearly defining what is expected. This will need to be assessed by the programme to ensure that organisations would be able to meet their commitments to providing support before devices are allocated.
2. Partnership working is crucial to enable organisations that have the reach to those who are digitally excluded but may lack internal resource to provide the required support.

Digital Champions Providing Support Remotely

On average, support calls took 50 minutes, although a significant amount of time was used dealing with technical issues related to both sim card activation and connectivity. Callers were positive about the communication with the digital champions, and remained patient despite the previously mentioned various challenges unrelated to learning. Despite the challenges of remote support, progress was evident. Discussion with the learners showed that 11% of participants had Foundation Digital Skills.[8] By the second call, 23% had learned all of the foundation skills. This suggests that ongoing confidence building is an essential part of digital champion delivery.

One digital champion noted:

> The calls have been a success, unfortunately 4G has hampered progress but hasn't deterred the user. I thought the 30 minutes would not work, as it would be too short a time, however, it seems to be a good amount of time to hold the learner's interest and not allow them to become frustrated with the connectivity issues.

Some learners made quick progress, even from a very basic starting point:

> We managed to get a couple of Google searches completed and the learner was extremely excited to get the results and scroll through to see how much and what variety of information was available.

[8] https://www.gov.uk/government/publications/essential-digital-skills-framework/essential-digital-skills-framework.

Digital Champions expressed surprise at the amount of self-directed learning by the device recipient since the previous call, with some learners experimenting with BBC iPlayer and YouTube.

> She mentioned she had really enjoyed using YouTube after our first call – she had found lots of things to make her laugh and distract her which she really enjoyed. She managed to download and register for BBC iPlayer and search for programmes, play them and pause them and return to the beginning to search for other programmes. She also went back to the home screen to check that she had an icon for BBC iPlayer which she did.

Digital Champions also reported that many learners also wanted to talk, and not necessarily about digital skills. Many of the learners were isolated and lonely, and any form of social contact was an opportunity for them to have general conversations about loneliness and anxieties about the pandemic. This reinforced the need for digital champions to be embedded in core service delivery, so that frontline staff are equipped and able to blend digital skills learning with other social interactions – and are subject to PVG checks and safeguarding policies should there be any significant concerns.

Mobile Device Management
Linked to the logistics of setting up the device, pilot sites encountered additional obstacles

> It was time consuming waiting for the pre-loaded apps to install and I did wonder if it was doing anything

A 'lending library' model was used to take account of the deployment of Mobile device management. All device recipients were issued with an agreement that set out what this meant, and to what extent the devices were managed and what information the programme had access to. This document explores concepts that can be difficult for most people to comprehend, and was more challenging for those without previous experience of the digital world. Digital Champions engaged in the pilot also reflected that Mobile Device Management created anxiety on the part of some device recipients, some of whom expressed concerns around surveillance and privacy.

A further issue that surfaced as part of the pilot was the ability to respond to requests to 'whitelist' additional apps and push further content. Both pilot sites requested apps specific to their user groups, and this demonstrated that delivery at scale would require a process to be able to respond to these requests.

Data Allowance

The cost of providing data is a key consideration for any device distribution scheme, and as such this provided a good opportunity to get a sense of how much data people would use over a period of time. At the pilot stage it became clear that for those most digitally excluded, 15GB of data was insufficient for their needs as their confidence with using the devices grew. Operating on a "topping up" data model was time consuming and not cost effective. To deliver this model at scale would not be possible.

Our pilot with Govan Housing Association saw their Digital Inclusion Team offer Netflix and Spotify access to families with children or individuals without a TV. Other individuals were introduced to services like YouTube for the first time. These data heavy apps meant that Data Allowances were maximised within days, meaning the individual was once again cut off from digital access or leaving the community project to continually top up data. To help users manage their data allowance there was a need to explain what exactly data is and how it's used, a concept that can be alien to someone who has no frame of reference for the digital world. The pilot sites were upgraded to 20GB per month for 12 months when their initial 15GB was used up, bringing it in line with the data being offered in Phase 1 of delivery at scale. From Phase 2 the data offer was changed to unlimited data for 24 months, and all previous data packages were upgraded to be brought in line with this.

5   Design Principles and Rationale

Following on from the initial pilots, Connecting Scotland scaled up at pace, with the programme officially opening in June 2020, three months after the initial call to action. The processes used for the duration of delivery, into 2022, remained largely unchanged, and influenced heavily through learning from the pilots. Subsequent pilots in May and June 2020 with children's charities, a Family Nurse Partnership and local authorities helped refine our learning and processes. There are some core design decisions that underpin the model that was used (see Fig. 4.1).

Application
- A 'phase of Connecting Scotland is publicly launched and organisations are invited to apply. Each phase has core eligibility criteria, defined by Scottish Government:
  - Phase 1: Clinically vulnerable to coronavirus
  - Phase 2: Families with children and young care leavers
  - Winter Support Packagae: older people and people with disabilities
  - Phase 3: Employability
- In addition to the thematic criteria, there are two core criteria across all phases: 'digitally excluded' and 'low income'

Assessment
- All applications are reviewed and assessed at a local assessment panel.
- SCVO convenes 32 assessment panels, one with each local authority area.
- Applications are checked to ensure they can meet the requirements of the programme.

Contracting
- Electronic contracts are issued to successful applicants by SCVO.

Distribution
- When organisations return their signed contarcts, SCVO begins the distribution process
- Weekly distribution orders are placed for devices (with XMA) and connectivity (Vodafone or EE)

Support
- Contracted organisations send their staff and volunteers to 'Digital Champion' training provided by Mhor Collective
- Organisations provide up to 6 months of support to device recipients
- Additional support is provided trhough a national helpline managed by People Know How

Fig. 4.1   Connecting Scotland core design decisions

5.1   Key Principles that Underpin the Model

Trusted Intermediary Organisations

Community-based organisations are key to the delivery of Connecting Scotland for multiple reasons:

- Access and reach to those the programme is designed to support. A key question in the initial Call to Action was 'How do we reach those needing support as quickly as possible?' These organisations already know their local communities and would be able to identify those that meet the criteria.
- Validation of eligibility. Each phase of Connecting Scotland has core (low income, digitally excluded) and thematic (e.g. clinically higher risk to coronavirus, families with children, young people) criteria. Rather than a prolonged bureaucratic process of assessing individual eligibility, a process was implemented that placed trust in these intermediary organisations to use the knowledge of their users to make this decision. These requirements are managed through the application process and an agreement between the intermediary organisation and Connecting Scotland following a successful application.

- Trusted relationships. It follows that if intermediary organisations are active and engaged with their local communities then so are the frontline staff and volunteers delivering support on behalf of these organisations. Trusted relationships are key to helping people develop their digital skills and confidence. Engaging with intermediary organisations enabled Connecting Scotland to leverage a large pool of potential Digital Champions.

Variety of Devices

The desire to streamline as much of the offer as possible, making it more manageable to create support resources and to limit the number of devices Digital Champions would need to become familiar with was a core aspiration. A key principle established early in the development of Connecting Scotland was that there was a desire to limit the number of different devices being used. These principles were also supported by practical factors such as demands on the supply chain for such a large quantity of devices at a time when there was unprecedented demands of technology suppliers. Consideration was also given to those devices in use by local authority education providers, and also to accessibility features.

Decision-Making Model

By forfeiting the requirement for end users to demonstrate their eligibility, there remained a requirement for some form of checks and balances to ensure that devices would be allocated in line with the aims of the programme. To achieve this, an onboarding process was established encompassing three strands: application, assessment and contracting. It was intended, from the outset, that the process be light touch, rather than onerous. The following outlines this light touch process.

- Allocation: At the time the thematic criteria is agreed for a new 'phase' of the programme Scottish Government decide on how the devices are to be allocated across local authorities. A baseline is set with a minimum number of devices available, and an indicative upper range of devices available for each local authority. This is to ensure that there is a fair distribution of assets across the nation. In Phase 1 and the Winter Support Package the Grant Aided Expenditure (GAE) calculation was used alongside the Scottish Islands Needs Allowance. In Phase 2, additional factors were considered to decide

on resource allocation, such as the Scottish Index of Multiple Deprivation (SIMD) and Free School Meals data.

- Application: An open call shared publicly, inviting organisations from the voluntary and public sector to apply for devices and connectivity for the people they support. Applicants submit an online application form which includes information about the identification of potential device recipients, what barriers they face, current support mechanisms, and how digital champion work will be provided. At the application stage an organisation will also indicate how many devices they are requesting, and how many Mi-Fi connections are required.
- Assessment: Following the deadline, all applications are assessed. SCVO convenes one assessment panel for each of the 32 local authority areas. A representative from each local authority joins the local assessment panel. This enables better decision-making, as a national programme will often lack local knowledge and place-based insights that can help inform better decision-making. The assessment process acts as a form of quality assurance to ensure that organisations receiving devices have undertaken due process to identify beneficiaries and have the required capacity to provide support.
- Contracting: Organisations that are successful at application stage then enter into a agreement with the project lead at Connecting Scotland. This agreement sets out what organisations will receive by way of devices and support, as well as setting clear expectations of their responsibilities to issues devices within specific timescales, collect and provide data on who devices have been allocated to, participate in evaluation activity and provide up to 6 months support for device recipients.

Mobile Device Management (MDM) and a Gifting Model

Following the use of MDM in the initial pilot, the decision was taken not to proceed with this approach for delivery at scale, favouring a gifting model whereby the devices belonged to the recipients. This decision was informed by lessons learnt during the pilot, namely:

- Privacy and the right not to be monitored
- complexity of a process to respond to request for specific apps relevant to certain groups
- Incompatibility of MDM with a gifting model, as the preferred model for delivery at scale

Mobile Wi-Fi (Mi-Fi) and Data

The pilot demonstrated that failing to provide sufficient levels of data would risk users not being able to use their devices and render the programme ineffective and also the concern that individuals who made use of the programme might be set back further that their original staring point as data would become a barrier they had not previously contemplated not accounted for Following the pilot, Phase 1 launched with an offer of 20GB per month for 12 months. Phase 1 data was managed through SCVO's corporate account with Vodafone, which allowed to the project to gather information on how much data was actually being used, and to identify how many connections were hitting their 20GB limit each month. As Phase 2 launched in August 2020 the programme had revised the data offering to unlimited data for 24 months, retrospectively upgrading connections from Phase 1. This was also in recognition of emerging research which highlighted the immediate impact of data poverty as lockdowns held (Nesta, 2021).

A further change introduced following the pilots was the use of a mobile Wi-Fi (Mi-Fi) device. This replaced the need for LTE enabled devices (i.e. devices which, through an on-device SIM, could access mobile WIFI over the 4 g network), which are more expensive to purchase, and provides an added essential benefit of allowing multiple devices in one household to connect at the same time, similar to a home broadband connection, allowing for greater household digital participation.

Support

Providing support for end users to build their digital skills and confidence is essential to the success of the programme. The adoption of the Digital Champion model enables the mobilisation of support at the scale required for the aspirations of the programme. Remote support can be used to help build digital skills and confidence, but it is not without its challenges. Resources need to be developed for each type of device being deployed to make this as easy as possible for Digital Champions. It was also recognised that there would be cases where Digital Champions would not be available, or that further support might be required.

6   Digital Champions and Training

As the project scaled up, digital champions remained an integral element of the work, identifying those most in need, to distribute devices, provide support with set up and to support end learners in developing not only the digital skills to access essential services (health/education/employment) services, but also to develop digital understanding to ensure that those digital skills might be applied to improve the learner's personal circumstances, and thus to support the development of 'digital capital'. Digital capital is defined by Ragnedda as 'the accumulation of digital competencies (information, communication, safety, content-creation and problem-solving), and digital technology. (Ragnedda, 2018, p.3) In other words, digital capital is the way in which material access (devices, connectivity) and digital skills (the 'second level' of the digital divide) then enable an individual to develop opportunities in the offline world, including employment; education; positive health and wellbeing; civic participation and more.

In order to empower digital champions to provide holistic and meaningful support, and based on the learning from the pilot phases as outlined above, a training programme was generated to cover key aspects including:

- The impact of digital inequality on marginalised groups of people drawing on key research in the field
- The barriers identified in academic research including opportunity, motivation and skills (French et al., 2018; White, 2017)
- The intersection of digital inclusion and social inclusion (Helsper & Reisdorf, 2017a)
- Quick start solutions to minimise the impact of barriers
- Key applications as defined above
- Exploring basic online safety messages including passwords, privacy and misinformation with key resources from trusted sources in the public domain to support digital champions (White, 2017)
- Accessibility features on the device and additional tools to support accessibility (again an identified barrier)
- Safe health information

At the start of lockdown, digital champions highlighted concerns about the impact of COVID-19 misinformation on marginalised groups and, in particular, the need for even frontline staff to use safe and trusted sources

of information. As a direct result, the training focussed on two key resources: NHS Inform and the Scottish Government's own Covid information site for citizens. These were explored during the session and links shared directly with participants.

7   REFLECTIONS, CHALLENGES, AND LESSONS

From project inception, the Scottish Approach to Service Design, with a focus on working at speed, and in an agile fashion, facilitated and enabled both rapid learning and rapid response to that learning. Two years on, we continue to learn from the work, and to develop to meet the needs of our citizens through the lens of trusted relationships of learning and support established across in third sector organisations.

Emerging literature from the pandemic continues to reflect the need for frontline staff in all fields where they may work with people who are digitally excluded to access, for themselves, contextualised support and training to enable them to develop the digital skills they need to then support others. Our early findings from this national approach suggest that while the fundamental understanding of the far-reaching impact of digital inequality now seems to have reached the majority of organisations working in this space, there will remain an ongoing need to ensure staff themselves have the necessary digital skills not only to do their job, but to ensure that those they directly support have sufficient digital capital to use skills and understanding in such a way as to improve their own lives and the lives of others.

The third sector in Scotland values the importance of lived experience to both inform and direct the work of charities and NGOs. This means that we must also accept, as a sector, that many of those working in these spaces have themselves direct, lived experience of digital inequality. They may themselves be experiencing digital poverty related to unequal access, and may themselves have lacked the opportunity, space and support to develop a level of digital understanding which allows them equal participation as a digital citizen. The challenge then is that we must work reflectively, focussing in on assumptions, prejudices and systemic inequalities also faced by staff in these organisations and provide real, person-centred support to ensure that digital champions have genuinely been given the space to explore their own digital skills and develop digital understanding.

In addition to the need to support the development of digital skills amongst frontline workers, the model is also dependent on organisational capacity. The capacity issue is a particular challenge in the context where 32% of charities say IT has become 'the biggest hurdle they face to achieving their digital plans' and that just under a third of charities (31%) say their staff 'are burned out from the demands of intense remote working'. (Amar, 2021) Building services based on trusted intermediaries is vital, and proven to work, but digital champions need skills, space, support and the appropriate digital tools to undertake this in their frontline roles. This requires financial investment and digital leadership.

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COVID-19: Responses to and the Impact of COVID-19

Digital Inclusion and Learning at Home: Challenges for Low-Income Australian Families

Kim Osman, Amber Marshall, and Michael Dezuanni

1   INTRODUCTION

The sudden switch to learning exclusively at home during the COVID-19 pandemic revealed the extent of low levels of digital inclusion for many low-income and socially disadvantaged families and children in Australia. During a series of lockdowns in states and territories around Australia in 2020 and 2021, schools were only open to children of essential workers and those deemed vulnerable. Many families struggled with access to, and the affordability of, devices and data, along with having the required digital skills and mentoring for students to learn at home. This left many

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children from low-income families to learn at home without the requisite access to suitable devices, broadband internet connections, and data.

While Australian families have reportedly high levels of access to the internet and devices "with around 95 per cent of families having access to the internet at home .... [and] on average two computers, 2.5 smartphones and 1.6 tablets in the Household" (Lamb et al., 2020), the quality of internet and device access across families is uneven. We know from the Australian Digital Inclusion Index (ADII) that people living on low incomes are amongst the least digitally included Australians (Thomas et al., 2021), and that nearly a fifth of Australian children under the age of 15 are living in poverty. This means nearly a million students in primary and secondary education in Australia need additional support to access appropriate devices and data to be able to undertake learning at home. Moreover:

> many low-income Australian households have spent long periods in lockdown without a low cost, high quality, fixed broadband product in the marketplace. Access to affordable devices that are appropriate for online work and education has also emerged as a major challenge. (Thomas et al., 2021, p. 8).

It is important to note that this is not an issue that arose solely because of pandemic, but a longer term, existing challenge for low-income families that has been brought to the fore of national discussion as schooling moved online during COVID-19 lockdowns. Low levels of digital inclusion amongst low-income families has some persistent characteristics; these people have less access to appropriate digital devices and "pay more for their data compared to other families, and have lower levels of digital ability" (Good Things Foundation Australia, 2021). Low-income families are also more likely to be mobile-only households as compared to the general population (Good Things Foundation Australia, 2021) and lack access to appropriate technologies for learning at home like laptops or desktop PCs. With expensive data and limited access to computers for schoolwork, children from low-income families in Australia face challenges for learning at home not experienced by their better-connected peers. The Australian Government recognises that "socially vulnerable children are over-represented among the group of students who are educationally

vulnerable"[1] and this combination of digital and social disadvantage has far-reaching consequences for the educational outcomes of children from low-income families in Australia.

The Government also states "All Australians need access to the technologies and the skills required to use them if they're to fully take part in social and economic life" (Australian Government, 2018), and education is arguably one of the most important areas of participation. As schools had to rapidly move to remote online, support in Australia for low-income families was ad-hoc, and often delivered via teachers and schools in lieu of any framework or policy response.

As social, government, education and commercial services move rapidly towards 'digital by default,' digital inclusion and in particular, digital ability, are critical for social and economic participation in society (Dezuanni & Allan, 2018; Al-Muwil et al., 2019). Digital ability and digital inclusion have been linked to a range of social and economic benefits. Australians who have adequate, affordable access to digital technologies and the knowledge and skills to use them, have better outcomes across life spheres including education, work, finance, health, and well-being (Walton et al., 2013). A rapid review of literature on the effects of events like the COVID-19 pandemic on education by Tarricone et al. (2021, 1) found, "that emergencies impact education in two main ways: endangering children's wellbeing, and exacerbating unequal learning outcomes…[and] the consequences of these disruptions are not evenly distributed". The review identifies children from low SES households as particularly at risk of experiencing disruption to their education due to learning at home during the pandemic:

> Greater responsibilities are also placed on parents when normal education is disrupted. Parents may need to spend extra time and money to support their children's education, which can highlight the disparities between the types of supports provided by high and low SES households. Specifically, higher SES parents can be expected to have greater resources to support the education of their children, while children from lower SES households are less likely to have access to necessary resources (e.g., electronic devices, and the internet at home) to support learning. This inequality is intensified by the disparity in human capital, with research showing that a greater proportion

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[1] Ministerial Briefing Paper on Evidence of the Likely Impact on Educational Outcomes of Vulnerable Children Learning at Home during COVID-19, https://apo.org.au/sites/default/files/resource-files//apo-nid303562.pdf.

of higher education–qualified parents indicate they are confident in directing their children's learning compared with parents without such qualifications (Cullinane & Montacute, 2020; Di Pietro et al., 2020; UNESCO, 2020c). Increased education responsibilities placed on parents can also interfere with their work responsibilities and undermine their financial ability to support their children's education (Hall et al., 2020; Reimers & Schleicher, 2020a, b). …. Furthermore, when schools are closed children from lower SES households suffer more because they generally do not have access to the means to support learning outside of school. (Tarricone et al., 2021, pp. 16–17).

Concerns for children's wellbeing and educational attainment are not isolated to Australia. While, up until the end of 2020, many Australians had experienced relatively short school closures as compared to other nations, New South Wales and Victoria (accounting for over 57% of the population) had extended periods of learning at home. Schools in Australia belong to either the government or non-government (Catholic or Independent) sector, with 70% of schools run by state or territory governments, 18% Catholic and 12% Independent. In general, schools are either primary (Grades P-6), secondary (Grades 7–12) or combined (P-12) with around 66% of students attending government schools, 19% attending Catholic schools and 15% attending Independent schools (ACARA, 2022). Due to the nature of federal and state government funding in Australia, government schools are generally under-resourced as compared to Catholic and Independent schools (Hanrahan, 2017) and have a higher number of students from low socioeconomic backgrounds (Flack et al., 2020). Learning loss due to school closures disproportionately affects children from lower socio-economic backgrounds, who usually attend under-resourced government schools, and the gap can continue to widen once school resumes (d'Orville, 2020; Galvis & McLean, 2020, pi; Lamb et al., 2020).

This chapter presents an overview of challenges faced by low-income families in relation to their children's education during the COVID-19 pandemic. Drawing on early data from an Australian Research Council-funded project, *Advancing digital inclusion in low income Australian families*, we discuss selected policy and community responses to address digital exclusion among low-income families with school-aged children when learning moved from schools to homes during COVID-19 lockdowns. We explore how these responses may inform future programs, practises and policies that improve the digital inclusion of children from low-income families.

2   Digital Inclusion Challenges
for Low-Income Families

According to the ADII, the average digital inclusion 'score' across the Australian population is improving each year, but the gap between those on low and high incomes has widened from 2020 to 2021 (Thomas et al., 2021). Life in low-income families is more challenging in the digital age than for middle-and high-income families and these challenges will intensify as services increasingly become digital-by-default. The Australian Government aims to be one of the world's top three digital governments by 2025 (Bushell-Embling, 2018). A significant risk of increasing digitisation is that many low-income families will increasingly struggle to access and use digital government services, because they may not be able to afford devices and connections, and/or they may lack the digital skills necessary to navigate platforms and applications. In a digital-by-default environment, low-income families with limited digital access and/or ability risk being unable to meet their obligations to service providers such as Centrelink, potentially suffering further exclusion through cancelled/paused payments or compounding debt. The broader trend of commercial and civic activities being carried out online (banking, shopping, voting, education, tax returns) suggests rapid changes in social and economic activity may disadvantage low-income families more broadly.

Currently, low-income families in Australia often face challenges associated with the three pillars of digital inclusion: access, affordability and ability (Australian Digital Inclusion Alliance, 2020); however affordability is a particular problem for those families who have the least to spend on services. In their report on digital inclusion in Australia, *Digital Nation 2021*, Good Things Foundation Australia found that:

> While the cost of internet access has reduced and overall relative household expenditure on telecommunications is comparable between 2019 and 2020, for low income households the proportion of income spent on internet access has increased every year since 2014 (Good Things Foundation Australia, 2021)

Thomas et al. (2021, p. 6) further observed that "for Australians in the lowest income quintile, most (67%) would have to pay more than 10% of their household income to gain (a quality, reliable) same connection." Accordingly, many families are mobile-only due to the connectivity costs of a home broadband connection and the flexibility and portability of

mobile data that can be topped up as needed and shared among devices. As a result of relying on mobile connection, low-income families with school children "spend about five times more of their household income on data access compared to families in higher income quintiles and compared to national spending" (Good Things Foundation Australia, 2021). Ogle & Law (2020, p. 4) found "that waged poor households are prioritising telecommunications expenditure to ensure they have the basics but are using sub-par services and devices."

Access to appropriate technology for learning has been further highlighted as a challenge for low-income families during the pandemic. Families rely on mobile phones and devices like tablets to complete schoolwork, along with connecting to essential government services, engaging with others on social media, watching entertainment and other creative and cultural activities using digital media, which are essential for full social and economic participation. International studies (Ragnedda & Mutsvairo, 2018) suggest that digital participation now underlies individuals' fundamental social competencies to enact identity, language and community (Andreasson, 2015; Helsper, 2008; Warschauer, 2003). Meanwhile, a key UNICEF report (2017) says that digital inclusion bolsters opportunity and justice for the three key groups on which our research is focused: school-aged children (through being able to complete internet-based homework/learning at home); young adults transitioning into the workforce (through gaining skills that enhance employability and access to training/jobs); and parents and caregivers, including grandparents (through increasing their own or their children's digital opportunities and promoting inter-generational digital mentoring). In the remainder of the chapter, we explore common challenges faced by these groups, recognising that although there are commonalities between low-income families' digital inclusion experiences, other socio-cultural factors such as gender, occupation, employment status, geography, ethnicity and interests also affect digital inclusion in Australian communities (Thomas et al., 2021).

3   Learning at Home Challenges and Consequences for Low-Income Families

In addition to the challenges posed by access to and the affordability of appropriate connections and devices, the COVID-19 pandemic highlighted the particular effects of low levels of digital inclusion for low-income families with children who are learning at home. The Australian

Communications Consumer Action Network (2019, p. 1) suggests for this cohort "it is harder for school age children to do their homework and keep up at school both academically and socially; it is harder for young people to prepare for the post-school world of further training, education or employment. For adults, it is virtually impossible to find opportunities and gain employment." Relatedly, the Australian Government's Digital Economy Strategy (Australian Government, 2021) invests in workplace development initiatives that demand "high-level digital skills" (e.g., graduate programs for artificial intelligence and emerging technologies). Given that children from low-income families perform significantly less well than children from middle-and high-income families on ICT literacy tests (ACARA, 2014; Lamb et al., 2020), low-income school leavers will likely be disadvantaged in a workforce in which digital skills are increasingly demanded by employers, and where there is high demand for technology workers (Deloitte, 2019).

Low-income parents and caregivers face an ongoing challenge to provide their children with expensive technology for school, and to provide them with the necessary advice and support to successfully participate in education with digital technologies (Katz et al., 2017). And apart from providing devices like tablets or laptops for schools with BYOD (bring your own device) policies, parents are also faced with additional educational costs for resources (including technology) when children are learning at home. A UK study found parents from more affluent families spent more money on educational resources when learning moved to the home during the pandemic, than those from less well-off households (Cullinane & Montacute, 2020). This is concerning because it points to further exacerbation of the divide between high- and low- income families in terms of student's access to essential digital resources for learning. Moreover, In an environment where there is an increasing emphasis on children using digital devices in the classroom and for homework (Dobozy, 2014; Graham & Sahlberg, 2020), children from middle and higher income households will pull even further ahead in their digital skills development from their peers from poorer families, owing to daily engagement with digital technologies.

It is also important that families' digital inclusion challenges are not considered in isolation from the wider social and educational barriers they face. The digital literacy and education of parents and care-givers impacts the amount of learning support they are able to give their children at home. Furthermore, "in addition to the fact that parents of disadvantaged

children may not have the skills or experience to support their child in home learning, children and young people living in low-income households have access to fewer books and learning materials in the home and more limited access to support and resources that help form a foundation for learning" (Lamb et al., 2020). People on low-incomes are also more likely than the general population to have low levels of media literacy (Notley et al., 2021). Digital and social disadvantage is often compounded in low-income families who face inter-generational challenges to digital inclusion (Notley & Foth, 2008). As Lamb et al. observe in their Victoria (Australia) study:

> While the vast majority of high SES parents … have themselves completed school and in many cases tertiary study, many low SES parents (41.6 per cent of mothers and 44.4 per cent of fathers, according to PISA estimates) have not completed secondary school or even reached the upper secondary level. This may explain why many students from low SES families in 2018 reported that across the school year they hadn't worked with their mother (47.0 per cent) or their father (56.3 per cent) on schoolwork. These rates were more than double that for high SES students. It indicates that support for learning from home is much more of a challenge for them. (Lamb et al., 2020)

Finally, there has been significant media coverage of the multiple stresses parents and caregivers face when trying to combine working from home during lockdown with supporting their child's learning. However low-income families face the challenge of parents and caregivers having to work *outside* the home in essential roles without the option of working from home (Hall et al., 2021). This leaves students from low-income families without another layer of support for learning from home during the pandemic.

3.1   Families Living Rurally or Remotely

Most of Australia's population lives in the south-east and south-west of the country, with relatively good connections to telecommunications infrastructure. However, for the families who live the country's north and interior, connections are often poor and expensive (Marshall at el., 2020a). Rural and remote low-income families, who are often who are mobile only users, face additional challenges as mobile services are limited; while over

99% of Australians have mobile phone reception, only one-third of Australia's land area has coverage (Good Things Foundation, 2021). Families also have less access to essential social infrastructure that supports digital inclusion and learning, like libraries and schools (Tarricone et al., 2021, p. 19; Marshall et al., 2020, b). Remote Indigenous communities are amongst the least digitally included in Australia, with many children (including non-Indigenous children from remote areas) often needing to attend boarding school due to a lack of secondary schooling options in their area. Children returning home to low-income households during school closures (and during holiday periods) often do not have access to the infrastructure and resources to support their schooling while at home (O'Bryan & Rogers, 2021).

3.2   Children Learning at Home in Australia During the COVID 19 Pandemic

Compared to other countries around the world, Australian schools have remained largely open during the COVID-19 pandemic, however lockdowns throughout the country have exposed the difficulties many families face when children are learning at home. As Australian states and territories have taken different approaches to managing the pandemic, schools have had to adjust to extended periods of delivering the curriculum remotely, or pivoting quickly to learning at home for short, sharp lockdowns. Lamb et al. observed that:

> Most schools across Australia were completely unprepared for the coronavirus and for moving to virtual learning. Unequal internet access is just the tip of the iceberg of the challenges some students face in doing their schooling online. (Lamb et al., 2020)

This experience was common among low-income families who were expected to access and complete schoolwork that was made available online through school portals and education sites like Queensland's, *The Learning Place*. A lack of policy leadership at both federal and state levels, is compounded by the complexity of a national curriculum being largely administered at the state level, and schools were left to individually develop strategies and operationalise plans for students to learn at home. One approach was for schools to use commercial platforms already in use like

Google Drive and Microsoft Teams (Reimers & Schleicher, 2020a). Where schools couldn't move easily to these platforms, they relied entirely on paper-based resources to ensure equity across their student population. In some schools in Australia "teachers were delivering or posting stationery to students to help prevent them falling behind. '[Research] found that about one-third of the public school teachers are actually providing pen-and-paper packages as a backup for a lot of students, where there may be difficulties with wi-fi and connectivity'" (Duffy & Kent, 2020). Teachers became a vital support for children in low-income families, identifying who needed extra assistance and providing material resources for children experiencing digital inclusion.

Education insight company Pinto Professional Learning surveyed more than 3000 teachers across Australia and New Zealand in 2020, matching Australian responses with Index of Community Socio-Educational Advantage (ICSEA) data from 2018. Researchers found "strong evidence that children attending the least advantaged schools were more adversely affected by the shift to online learning than others and that the shift therefore may have compounded existing inequities in the school system" (Flack et al., 2020, p. 4). The same survey revealed the main concern of teachers from less advantaged schools was students' lack of access to devices and technology (Flack et al., 2020). Across all three digital inclusion pillars of access, affordability and ability, low-income students face challenges to participation that are amplified when education moves to learning at home.

4   AUSTRALIAN RESPONSES TO SUPPORTING LOW-INCOME FAMILIES LEARNING AT HOME

All states in Australia had a period of learning at home from March 2020 when a national state of emergency was declared and all states went into lockdown, however New South Wales and Victoria were the only states with extended lockdowns through 2020 and 2021. In this section we present case studies from two communities that we are working with on our project, *Advancing digital inclusion in low income Australian families*: one a city suburb in Australia's most populous state, New South Wales; and one from the outskirts of a regional city in Queensland, the most decentralised state on the mainland.

4.1   Case 1: New South Wales

Community Overview

- Population: 19,400
- 13% of households do not have access to the internet at home
- 55% of students are in the lowest Socio-Educational Advantage quartile
- 98% of students have a language background other than English (Table 5.1)

New South Wales (NSW) has had different COVID-19 restrictions in place throughout the state at various times during the pandemic. In comparison to other Australian states NSW had looser restrictions and took longer to implement them resulting in quick transmission across Sydney. The community we are working with was subject to the tightest restrictions in the state, which were implemented according to local government areas (LGAs). NSW's approach was criticised for having tougher restrictions, for longer, in less affluent LGAs (Rachwani, 2021). Low-income families struggled to do online learning with affordability and ability being prominent barriers to digital inclusion in the community.

The difficulties families experienced in accessing appropriate devices and affordable data for learning demonstrate the work Australia has to do to ensure everyone can "fully take part in social and economic life." NSW leads the country in policies and programs for improving digital inclusion for its residents (see Table 5.2), yet resources still do not meet community need. NSW provided over 22,000 devices and dongles to vulnerable

Table 5.1   Community 1: Australia

	Community 1	*Australia*
Aboriginal & Torres Strait Islander Peoples	0.2%	2.8%
People born overseas	63%	26%
Speak a language other than English at home	82%	21%
Not proficient in English	32%	10%
Median weekly income	$603	$877
Completed year 12	58.2%	51.9%
Unemployment rate	13%	6.9%

Source: https://dbr.abs.gov.au/https://www.myschool.edu.au/

students who would otherwise not have access during the pandemic, but this only met the needs of little over a quarter of an estimated 80,000 students in need (Zerbib et al., 2021). Timing of device and data provision was also an issue for schools and students who have been expected to quickly pivot to online learning during school closures. Gore et al. (2020) found "teachers experienced either: 1) not receiving this additional support; 2) receiving the support too late, 'we qualified for 500 devices after we completed the questionnaire. We received 50, but we received them halfway through Term 2'."

In addition to the government responses outlined in Table 5.2, and the efforts of teachers working directly with students, ad-hoc support was provided by a variety of social infrastructure organisations. The NSW Public Education Foundation supplied grants between $1500 and $2000 to around a third of the 1200 students who apply (Duffy, 2020). Narang Bir-rong Aboriginal Corporation (a NSW-based organisation that provides care and support programs for Aboriginal and Torres Strait Islander children, young people and their families) currently has "at least 200 children … without laptops, iPads or computers, preventing them from participating in online learning" and the organisation is calling for donations and partnering with a local IT company to ensure they are suitable for children to use (Narang Bir-rong Aboriginal Corporation, 2021). Children's charity Variety runs a Tech 4 School Grant that "provides a technology pack to students facing financial hardship to ensure they are not disadvantaged due to disruptions to schools during the COVID-19 pandemic" and focuses on the areas of NSW most affected by previous crises like the bushfires (Variety, 2022).

4.2   Case 2: Queensland

Community Overview

- Population: 4100
- 23% of households do not have access to the internet at home
- 61% of students are in the lowest Socio-Educational Advantage quartile
- 25% of students have a language background other than English
- 38% Indigenous students (Table 5.3)

Queensland's approach differed significantly from NSW and required schools and students to respond quickly to lockdowns that were largely

Table 5.2 NSW Policy Responses & Funding related to digital inclusion and school closures

Intervention	Description	Budget	Type	Year
Rural access gap direct intervention package[a]	Deliver improved access to digital teaching, learning aids and collaboration tools to rural and remote schools	$365.8b	Infrastructure	2020
Laptop loans to help bridge the digital divide[b]	Surveying school communities to find out which households don't have computers at home for online learning		Education	2021
COVID intensive learning support program[c]	$337 million to employ up to an additional 5500 staff to deliver small group teaching sessions across the state during 2021. The program aims to support students who were disadvantaged by school closures due to COVID-19.	$337 m	Education	2021
Device loans[d]	Principals may loan school-owned devices via the Oliver library system. Principals may choose to use the school's allocated student equity funds to purchase additional devices.		Education	2020
High-speed internet[e]	$328 million upgrade over 18 months to deliver high-speed internet to over 2000 NSW public schools.	$328 m	Education	2020

[a]https://education.nsw.gov.au/campaigns/schools-digital-strategy

[b]https://education.nsw.gov.au/news/latest-news/laptop-loans-help-bridge-the-digital-divide

[c]https://www.audit.nsw.gov.au/annual-work-program-2021-24

[d]https://education.nsw.gov.au/teaching-and-learning/learning-from-home/leading-at-home/leading-the-management-of-the-school/digital-equity#COVID-192

[e]https://www.nsw.gov.au/news/faster-internet-for-all-nsw-public-schools

concentrated in the state's South-East. As such the community we are working with has only had one extended lockdown and one snap lockdown throughout the pandemic, but both served to illuminate the extent of digital exclusion in regional areas in the state. In Queensland nearly one-third of students "reported receiving mainly paper-based learning materials during the lockdown" and 15% of students in the community did not have access to a computer laptop or tablet device and the percentage of students without access to a device and the internet during the

Table 5.3 Community 2 profile

	Community 2	*Australia*
Aboriginal & Torres Strait Islander Peoples	11%	2.8%
People born overseas	13%	26%
Speak a language other than English at home	8.5%	21%
Not proficient in English	10%	10%
Median weekly income	$666	$877
Completed year 12	39.8%	51.9%
Unemployment rate	14%	6.9%

Source: ABS, Myschool

lockdown was higher in lower socio-economic areas (The State of Queensland, Queensland Audit Office, 2021).

Queensland also lags behind other states in internet access in schools, with 98% of students getting internet speeds less than 250 kbps in the classroom. Education Queensland's benchmarking for internet speed in schools is 25 kbps per student which is 200 times less than NSW's benchmark speed (The State of Queensland, Queensland Audit Office, 2021). At schools with a lower ICSEA score, children tend to have less access to technology and devices at home than children from schools with a higher ICSEA score. At one Queensland school, 60 percent of its families do not have regular internet access, placing increased importance on quality access at school. During the pandemic, this school's Principal noted most parents collected paper packs (Hartley, 2020). Queensland children from low-income families who rely on access to technology and the internet at school are therefore at a significant disadvantage to their interstate peers.

In contrast to NSW, Education Queensland did not have a clear policy response to supporting low-income families to access the necessary resources for online learning at home. The Queensland Government's policy responses to digital challenges during the pandemic focused on small business, skills and rural and remote connectivity. Queensland Government did, however, partner with national television broadcaster Channel Seven to air two hours of primary-level educational TV three mornings a week during the first extended lockdown (Queensland Government, 2020), but there was no state-wide response to the challenges faced by low income families and children learning at home during the pandemic.

5   Social Infrastructure to Support Learning at Home During the Pandemic and beyond

> While telecommunications providers have made some important steps to improve affordable internet access during COVID-19, such as hardship arrangements and government-agreed upon principles, these initiatives are largely fixed-term and do not provide a long-term solution. Community-based and not-for-profit organisations have supported people to stay connected during COVID-19 restrictions by providing affordable access through data-enabled digital device rentals and remote digital skills and social support by phone, when online was not possible. (Good Things Foundation Australia, 2021)

The federal government announced a $50 million package designed to help internet service providers (ISPs) provide accessible home broadband to low-income families with school age children (NBN Co, 2020; Cormann & Fletcher, 2020) who were not connected, or had let their connection lapse for more than 18 months. The discount scheme was to be delivered by the retail ISPs, however the final product varied across different service providers, if they created a specific low-income at all, and was time-limited. Data from the three months following this announcement shows an additional 383,257 new services were connected or upgraded (Australian Competition and Consumer Commission, 2020), however it's unclear how many new connections were making use of low-income products and how many connections were the result of large parts of the population moving to working from home, where they may have previously relied on a mobile or slower connection. Additionally, as the research and case studies reported here show, many low-income families were still relying on inadequate connections and devices to learn at home, which suggest that any low-income product that was made available, was not widely taken up.

Organisations throughout Australia are left to largely support low-income families across the three pillars of digital inclusion, access, affordability and ability, both prior to and during the pandemic, which is ongoing in Australia. In an effort to address the learning loss that can persist when digitally excluded children return to school (Kaffenberger, 2021) programs like The Smith Family's *Catch-Up Learning Pilot* ensured students that needed extra support received a device and data to learn online. Students involved in the pilot were provided with one-to-one online tutoring sessions in literacy and numeracy with qualified teachers (The

Smith Family, 2020). The success of the pilot in improving student outcomes demonstrates the impact that access to technology along with ongoing support has for students from low-income and disadvantaged backgrounds who are most likely to suffer from school closures (Cullinane & Montacute, 2020). Similarly, The Brotherhood of St Laurence ran study support groups online (Temple, 2020) and Save The Children Australia did resource drops to vulnerable families to keep students engaged with learning (Save the Children, 2022). In addition to this, the large telecommunications companies in Australia have been partnering with governments and organisations like The Smith Family to provide dongles, data and platforms to enable learning from home (Temple, 2020; Ebeid, 2020). Programs such as those listed above have built on existing work being undertaken by non-government organisations to support the educational needs of children in low-income families, whose digital exclusion is an entrenched problem that has been highlighted by the COVID-19 pandemic.

6   CONCLUSION

Schools in Australia were left largely to their own devices in lieu of any coherent national policy or advice to meet the digital educational needs of vulnerable children from low-income families. There are ad-hoc programs to support low income families with children learning at home, but no clear federal policy responses to ensure disadvantaged students can keep up with their peers. State-based responses to address the needs of children in low-income families learning at home during the pandemic are varied, and responsibility for ensuring low income and disadvantaged students have access to devices and data is devolved to school principals. Non-government community service providers are helping low-income families access devices and data, but cannot meet the needs of an increasing number of families who need assistance with learning at home.

Learning at home during the COVID-19 pandemic in Australia was difficult for many families on low incomes, but the challenges they faced are not isolated to the pandemic. Children from low-income families with limited access to data, appropriate devices, and the ability and support to use them have historically experienced worse educational outcomes than their better-connected peers (Echazarra & Schwabe, 2018). Nonetheless these students can improve their achievement (and even exceed their peers) with access to devices and data and the support to use them

effectively. Promoting digital inclusion—in particular digital ability (knowledge, skills and capabilities)—in low-income families will improve people's lives and promote social cohesion through building digital capacity for participation in daily life, education, work, and civil society.

Furthermore, increasing digital inclusion of low-income families will yield intergenerational benefits to Australia, helping to future-proof our workforce. According to the Australian Communications Consumer Action Network (2019), flow-on benefits of greater digital inclusion in Australia at the macroeconomic and sectorial level include: (1) uptake of online government services, saving the Australian Government $20.5billion in the next decade and customers 163 million hours per annum; (2) use of telehealth services which, according to the CSIRO (Celler et al., 2018), could result in reduced spending in Medicare Benefit Scheme (45% reduction) and Pharmaceutical Benefits scheme (25% reduction), as well as a 50% reduction in hospitalisation and a 40% reduction in patient mortality, and;(3) engagement of students from low socio-economic backgrounds in online training and digitally-enabled pathways to employment could help alleviate the fiscal cost of disengaged youth over their lifetime, which had been conservatively estimated at $18.8 billion, with social costs estimated at $50.5 billion and a deadweight loss of $1.5 billion associated with tax and transfers (Australian Communications Consumer Action Network, 2019).

Improving the digital inclusion of low-income families requires investment in schools as when schools are well resourced, switching between in-class and home learning is easier and can have benefits for students and their parents and carers who feel more engaged with class content and teachers (Bubb & Jones, 2020). However, "high-quality provision is useless if children cannot access it, and another significant challenge is providing all pupils with the equipment needed to learn online, as well as ensuring all have the stable internet connection necessary to access that content" (Cullinane & Montacute, 2020). This will require significant investment in physical and social infrastructure across Australia and a coordinated effort across government and the social sector to meet the digital inclusion needs of low-income families to ensure that all children learning at home have affordable and appropriate access and support.

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How to Make Affordability-Focused Digital Inclusion Interventions More Effective: Lessons from the Connected Students Program

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1   Introduction

This chapter discusses findings from the Connected Students program, a digital inclusion initiative delivered by Telstra (Australia's largest telecommunications provider) and evaluated by researchers based at RMIT University. The program specifically aimed to address the affordability

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barriers to digital inclusion experienced by low-income households in a large regional town in Victoria, Australia. Drawing on findings from the program, this chapter outlines lessons and considerations for future digital inclusion programs.

Digital inclusion is multi-faceted: it requires access to connectivity and devices, the capacity to pay for these connections and devices, and the skills and literacies to effectively use and benefit from these connections and devices (Thomas et al., 2021). There is a rich literature engaged with digital inequalities. While digital divide debates gained ground in the 1990s, it is important to remember that, as Yates et al. (2015) tell us, study "of differences in access to and use of Information and Communication Technologies […] has been undertaken since the 1960s" (p. 1). The point being that these dynamics of inequality are not new, and, indeed, tend to conform to existing lines of deprivation.

Affordability barriers to digital inclusion involve both the costs of internet data, as well as the costs of accessing digital devices (Chen, 2017; Chen & Li, 2021). The role played by affordability in terms of facilitating or restricting experiences of digital inclusion has gained increasing attention, with this focus sharpened in the wake of the COVID-19 pandemic (Campbell & Mithen, 2021; Harvey et al., 2021; Middleton, 2021; Robinson et al., 2020). In the move to online education, and the significant economic impacts resulting in job losses and income reductions, the impact of affordability barriers on low-income households has been heightened. Additionally, where households may have previously turned to public access points (e.g., libraries, or Wi-Fi in public spaces) to negotiate intermittent or non-existent access, with the introduction of restrictions on physical movement, these options were effectively removed (see, e.g., Elliot, 2018; Strover et al., 2020; Thiele, 2016 for discussion of the importance of such public access points).

For low-income households with school-aged children, affordability barriers to digital exclusion can result in what is sometimes called the 'homework gap'. This gap refers to the difference between those students who can complete schoolwork at home because they have access to the necessary resources (e.g., reliable connectivity, and an available device), and those who are not (Bronzino et al., 2021; Gan & Sun, 2022; Lee, 2020; Popiel & Pickard, 2022). This is not an insignificant problem. According to Middleton (2021), just under one third of Canadian parents with children learning from home reported they would need to access an internet connection outside the home to facilitate their children's

education. In the US in 2018, according to Bronzino et al. (2021), around 12 million young Americans were on the wrong side of the homework gap. In New Zealand, more than 30% of state or social housing residents lack a household internet connection (Elers et al., 2022).

In 2020 in Australia (when the Connected Students program commenced) there were slightly fewer than four million primary and secondary school students (Flack et al., 2020). Of these, around 800,000 (or 20%), were from households that earn under AUD $35,000 per year, and thus fall in the lowest income bracket (ABS, 2019; Drane et al., 2020). These families experience significant impacts from affordability barriers to digital inclusion. Australian low-income families with school-aged children have, on average, half as many desktop, laptop, or tablet computers as middle-income households (Rapid Research Information Forum, 2020; Australian Bureau of Statistics, 2018). In 2020, 68% of all households in the lowest income bracket (earning under $33,800 per annum) would need to spend more than 10% of their household income to acquire a quality and reliable connection (Thomas et al., 2021). For households in the lowest income bracket that include young people or children, this increases to 89% (Thomas et al., 2021).. In comparison, families with school-aged children in other income quintiles only spent 1.09% in the same year (Thomas et al., 2020). These high costs for low-income households are partly driven by reliance on mobile-only access (Ogle & Musolino, 2016). In 2020, 19.9% of the Australian population was classified as mobile-only internet users, with this increasing to 33.5% of low-income families with school-aged children (Thomas et al., 2020).

Digital inclusion policies and initiatives designed to reduce digital exclusion among school-aged young people typically take one of two approaches. The first approach is oriented around the provision of digital devices such as laptops or tablets. The second approach is oriented around the provision of connectivity, for instance, through mobile Wi-Fi dongles. Few strategies aim to address affordability of devices and affordability of connection. One exception is the Digital Access Program provided by The Smith Family, an Australian children's charity supporting disadvantaged children and their families. The Digital Access Program provided a limited number of laptops, internet packages and ongoing tech support to eligible families. The Connected Students program likewise aimed to address both elements of the affordability problem: providing participating households with a laptop (mitigating the costs surrounding device acquisition), and a

household internet connection that could support multiple devices at once (mitigating the costs surrounding connectivity).

2   The Connected Students Program

Telstra's Connected Students program aimed to measure the impacts of removing affordability barriers to digital participation for low-income households. The Connected Students program was conducted in Shepparton, a regional city located 180 km north of Melbourne, and delivered in partnership with a local secondary college. Shepparton was chosen as the program's site because it is characterised by a unique combination of low-income and low levels of digital inclusion. It has significant culturally and linguistically diverse (CALD) and Indigenous populations, and high levels of unemployment compared to state and national averages. Working with Greater Shepparton Secondary College (GSSC) to connect with students and their families, the program provided technology kits to low-income households with at least one student at the school between the ages of 15–18. The kits consisted of a laptop, a $G combined modem-router, and an activated SIM providing unlimited broadband on the Telstra network for the duration of the project (Fig. 6.1).

Fig. 6.1 The Connected Students kit consisted of a laptop, 4G combined modem router and sim card (not pictured)

Our evaluation of the Connected Students program aimed to contribute evidence on the significance of affordability barriers for digital inclusion, and provide qualitative data on the lived experiences of digital exclusion by:

- Identifying the value of connectivity and individual device access for students and education
- Identifying the impact of unaffordable connectivity (i.e., access that creates and/or requires financial strain) on digital inclusion

A total of 100 kits were handed out in the program. From these, 183 participants from 45 households engaged in the Connected Students evaluation. Data collection methods included semi-structured interviews via video conferencing platforms, face-to-face interviews, surveys with households, surveys with individuals, and videoed technology tours with households (see https://www.digitalinclusionindex.org.au/connected-students-project/for full description of methods).

Data collection began in April 2020 and was ongoing until July 2022. In April 2020, we collected information on access, internet related expenses and skills through household and individual surveys modelled on the Australian Digital Inclusion Index. The first round of interviews in 2020 sought to understand the dynamics of each household, who lived there, their daily routines, how technology factored into their lives, the costs of access and devices and how decisions were made regarding these, and the significance of the Connected Students kit. The second round of interviews occurred in 2021 and were conducted in person at the participants' home. In addition to tracking the ongoing influence of the Connected Students kit, we used the second household interview to unpack key ideas and findings from the first round of data collection. For example: How do low-income households define concepts such as 'tech savvy'? How does parental digital inclusion impact adolescent experiences and opportunities? What value does individual device access have for generating digital inclusion outcomes? What value does digital inclusion have for low-income households? We also did technology tours during these in person visits to understand how digital technologies fit within the home, and how the home and digital literacies can intersect and disrupt digital inclusion. A final round of exit interviews was conducted remotely in mid-2022. These participants received a $50 Coles voucher in recognition of the value of their time. Overall, we conducted a total of 41 household

interviews by online video, and 24 household interviews and technology tours in person.

Within our sample, four households had at least one member who identified as Aboriginal and/or Torres Strait Islander; thirteen had at least one member who identified as CALD; and fourteen households had at least one member with a long-term disability or health concern. Thirty-six households received one or more government pensions or benefits, including Job Seeker Allowance; Carer Payment; and Disability Support Pension or Disability Pension.

3   Considerations for Future Digital Inclusion Programs

The Connected Students program has highlighted several key learnings that can inform the design and rollout of future digital inclusion programs aimed at addressing affordability barriers.

3.1   Interventions at the Individual Level Impact Digital Inclusion at the Household Level

The Connected Students program was primarily targeted at senior high-school aged children. These participants reported a range of important benefits including an increased ability to participate in schooling, especially during periods of online learning due to the COVID-19 pandemic. When asked about the impact of the kits, however, families also described a range of benefits for the wider household. These benefits resulted from their ability to better manage and distribute resources across the household – including money, devices, data, availability of time, and material spaces within the home.

Due to their low socio-economic status, families within the program generally grappled with how to distribute their limited financial resources. Prior to receiving the Connected Students kit, parents with multiple school-aged children often told us that they struggled to decide which child/ren they should prioritise purchasing devices for. They also deliberated over how to stretch their finances to retain or maximise their internet access, sometimes prioritising it over other household essentials. As well as relieving the pressure of these decisions by adding another device and a free connection to the household, the Connected Students kit enabled

money that would have been spent on devices and/or an internet connection to be redirected to other household necessities. Louise, for example, lived in a rental property with her partner and their two teenage children. They cancelled their regular internet plan when they received the Connected Students kit. Louise explained that they were able to redirect this money to other expenses, particularly food which she noted was a significant cost due to their teenage son: "he eats us out of house and home". Other households reported that by covering their internet costs, the kit allowed them to pay off other bills, or to engage in some discretionary spending, like going out for a meal as a family.

This reduced pressure on resources had a secondary effect of reducing conflict between family members over device and data usage. Karla reported that her six-person household, which included three teenagers, frequently exceeded their data limit prior to receiving the kit. She described the stress of situations where "somebody's downloading songs or something and, you know, we've got 3% of data left and we've still got 25 days to go. And you know how slow it gets when it gets down to the last couple of percent — that just used to do my head in." These situations led to disagreements and tension over who had been using the most data and for what activities, however these arguments stopped when the family had the kit's unlimited connection.

Another household-wide benefit was reduced pressure on family schedules. For example, prior to receiving the kit, some families had been making frequent trips to the public library so that children could use the computers and/or Wi-Fi access to complete their homework. Melanie, who was a sole parent with two children, described the benefits of increased flexibility once they received the Connected Students kit:

> That was our weekends: in the library until Ellie finishes her homework… I'm not complaining, public libraries are great and we had a good time. But it was one extra chore that you have to do and now she can do [her homework] in her room […] it reduces the pressure a lot, because going to the public library is a completely different level of pressure. You have to find the time of the day. If I feel sick, I can't go; then Ellie is behind with her homework.

Households also benefited from the ability to use technology throughout the home. For example, the provision of an additional device combined with the improved connectivity enabled some students the option of doing

schoolwork on their laptops in quiet spaces of the home, such as their bedroom. For one participating student, Alice, this meant she no longer had to use the family desktop, which was in a noisy, bustling area of the home between the kitchen and living room.

As many of these stories indicate, some of the household-wide benefits of the Program stemmed from the fact that many household members made use of the kit, not just the participating student. The internet connection was of value in this regard. Prior to the kit, some households had no home internet and relied solely on limited mobile data; others had home internet but the plans they could afford were inadequate for their needs, meaning they would often run out of data and must carefully regulate their use. Some families had adequate data, but their existing router was not powerful enough for the signal to reach all areas of the home. With the introduction of the Connected Students internet connection, household members were able to engage in new kinds of online activities. In some cases, this involved shared use of the internet which provided new ways for families to spend time together, such as watching movies via streaming services.

Adults within the home also used the connection, and sometimes the laptop, for a range of purposes including work, study, and accessing government services. One example of this was Noel's household. Noel was 16 years old and living with both his parents and older brother. His family were paying off the mortgage on their home, but money had been tight since his mum lost her job. Before receiving the Connected Students kit, they relied on mobile phone access and shared one laptop between them, hot-spotting off mum Vanessa's phone to do so. She described the kit as "absolutely brilliant". It had allowed Noel to participate in online learning during the COVID-19 school closures, which would have otherwise been largely impossible due to his limited internet and device access and had provided a range of benefits for Vanessa too. Most importantly, she had recently signed up for an online university course to improve her employment prospects and told us how the Connected Students kit had given her confidence studying online:

> [Studying online] would have been a lot harder [without the kit] because I would have been using the hotspot off my phone. Whereas having the Connected Students kit…I'm not going to have to worry about the internet connection…I would have a world of trouble getting a laptop to connect to my phone sometimes. So having the Connected Students kit, it's given me

> some comfort in knowing I'm going to have a good internet connection to
> use to do these studies.

Through these kinds of uses by adults within the home, the kit supported education, skill development, and income generation for the household. Access to the internet was also often shared with visitors to the home, and in some cases, the laptop was shared with friends and family outside of the home.

These wider benefits for the household became evident due to the analysis approach used in the Connected Students evaluation, which was characterised by two key features. The first was that analysis included the whole household, rather than just the participating student or one parent. We interviewed and surveyed as many members of the household as possible and asked questions about the impacts of the kit across the household rather than just on the individual student. This approach illustrated the wider household benefits which may be overlooked in evaluations that consist solely of individual surveys or interviews with or about an individual participant. Secondly, our analysis included detailed qualitative data collection. Households were interviewed up to three times over two years, and these interviews were conducted in the home whenever possible to incorporate a technology tour. These interviews revealed much more nuanced impacts than were captured in the surveys which detailed only types of devices. Overall, this approach demonstrates the need for research that considers the contextual, fluid dynamics of family life to better inform strategies of intervention and identify potential impacts beyond the individual.

What stands out is the way in which interventions such as the Connected Students program have exponential impact. They impact the individual, which impacts the broader household, and that then impacts how household members are participating in or influencing the broader community, etc. Evaluations that go beyond the individual can help to identify these broader benefits, especially when qualitative methods are used within those evaluations to help unpack the nuances of these impacts.

3.2   Devices Are Critical to Digital Inclusion

Digital inclusion initiatives that only provide internet connections will be of limited use for people who lack devices. Prior to the Connected Students program, many of the students did not have adequate access to devices

appropriate for schooling. Some, as noted previously, were having to travel to libraries to use computers. Others were trying to make do with whatever devices they had at home. For some students, this meant attempting to do homework via their older model smartphones. One such student was Rose, who was 17 years old, and living with her mum Valarie in a house they rented from a private landlord. She had a part-time job at a cafe and earned extra money babysitting. Rose explained how, prior to receiving the Connected Students kit, she was relying on her mobile phone to complete her schoolwork, submit her schoolwork to teachers, and attend online meetings. She reflected, "having the laptop was like a big lifesaver".

In other households, children were sharing one computer with many other family members. Tihani lived with her husband and nine children, four of whom were high school aged students. She explained that before the kit, the household had been sharing one laptop:

> Clara's [connected students] laptop is really helpful for her homework. Because it was only my laptop they were using [before], and there's too many of them. It's really helpful for her to just give her space to do her own thing on her own laptop. So I'm really happy about that.

Parents often identified the cost of devices as a major challenge, especially those with multiple school-aged children. Had the Connected Students kit not included laptops, many of the students would not have been able to make meaningful use of the internet connection provided within the kit.

When providing devices, there are a range of considerations around the type, capacity, and longevity of those devices. The Connected Students program provided school-recommended laptops. However, some students reported technical issues with their devices, highlighting the need to consider the durability and capacity of devices alongside the type of device. Some students also found that the laptops didn't extend to uses, like senior media subjects, further illustrating the need to consider device capabilities. As noted above, Rose described the laptop as a "lifesaver" as it meant she no longer had to complete schoolwork on her smartphone. However, in later interviews, she noted that the laptop became progressively slower and by the end of the first year was taking 15 minutes to turn on. She attempted to reformat the laptop, but this was unsuccessful. Additionally, the laptop wasn't equipped with a graphics card capable of running the advanced software needed to complete assessments in her Media Studies

class. As a result, she used funds she had been saving for university to purchase a new laptop so she could complete her studies.

Within the Connected Students program, the technical problems that people encountered were often exacerbated by a lack of suitable support available through the school together with the individual students' limited knowledge about how to troubleshoot issues or maintain the functionality of devices and systems over time. For example, among those who experienced a decline in laptop functionality, some of these issues may have been avoided if the devices had been more actively maintained (e.g. managing data storage capacities). Similarly, a few participants reported problems with their internet connections, however it appeared that at least some of these were due to issues that could be resolved through simple actions like restarting the device or repositioning the router to an area of the home with less obstruction.

These kinds of issues highlight two important observations: firstly, that sometimes the technologies provided as part of digital inclusion initiatives will fail, and secondly, that digital inclusion requires more than access to connectivity and devices. The ability to use and maintain devices – often talked about in terms of 'digital literacies' – is also crucial. This latter point has been well-established in literature on digital inclusion which widely recognises that for digital inclusion to be experienced, access alone is not enough. And, as technologies increasingly advance in complexity, the skills required to draw benefit from digital access and use are an ever-moving target.

These observations show that beyond providing adequate devices, digital inclusion policies and programs should also consider providing wrap-around support for when devices fail, or technical problems arise that participants can not address. This wrap-around support could include guidance around maintaining devices, clear directions for accessing technical support, services for repairing broken devices, and/or training or advice around troubleshooting problems. One of the difficulties is that providing such support is resource intensive for the provider. Yet these considerations are critical for ensuring digital inclusion interventions have sufficient longevity in terms of environmental sustainability, maximising returns on investment, and benefits to recipients.

3.3   Access to an Affordable and Quality Internet Service Is Critical to Digital Inclusion

Digital inclusion initiatives can sometimes assume that people who lack internet access do not yet understand or value its benefits. In contrast to this, Connected Students households described in interviews how much they valued internet connectivity before they participated in the program. They were aware of its benefits and were often working hard to maximise whatever connectivity they could afford. While the costs of doing so could be challenging for families to meet, they often prioritised internet connectivity in their spending, in some cases prioritising it over other essentials such as groceries. One household that worked hard to maintain their internet access was Jade's family. Jade was 18 years old and lived in a rented household with her parents and two siblings. One sibling, her younger sister, has global development delays and was cared for by her mum. Her 9-year-old cousin also stayed with the family regularly, and the family occasionally provided respite foster care. Despite the financial pressures they experienced, Jade's mum Gina was adamant about the importance of having internet access in the household.

> You think 'Oh my god, you know, why is this [internet] so expensive?' But it's just a necessity these days isn't it? You have to have it. The kids have to have it for school so obviously you pay your rent and your heat, but internet access is factored in those living expenses […] I don't think it's something that you can say 'Oh I'm sorry, you're not having it.'

For Gina, the internet connection was non-negotiable despite the pressure it put on the family's budget. In removing these connection costs, the Connected Students kit reduced pressures on participating households' budgets and led to the range of benefits that have already been outlined above.

A related observation is that the quality of the connection is also important. Introducing a quality connection through the Connected Students kit provided more than just financial benefits by improving how household members could access and use the internet. For example, among the households that had a home Wi-Fi connection prior to receiving the kit, several described having 'black spots' throughout their homes where the Wi-Fi would not function. These black spots were often in bedrooms, which were located away from communal living areas where the router

was typically located. In some instances, this issue could have been resolved through the purchase of Wi-Fi range extenders, however none of the households within the study had chosen to do this. This indicates not only the financial challenge of purchasing supplementary devices, but also the influence of digital literacies on troubleshooting connectivity problems. With the more powerful router provided by the Connected Students kit, connectivity extended further throughout the home, giving household members greater agency and flexibility. Like many participants, for student Opal and her sister, the Connected Students kit allowed them to use the internet in their bedrooms for the first time. Opal told us that this made it easier for them to complete schoolwork as they could work "without interruptions". Their mum, Sophie, agreed, adding that it had also given each of them "their own space" and had meant there were "less arguments" between them. Similar benefits were reported among households that had previously relied on patchy mobile connectivity which restricted their internet use to specific areas of the home. These examples highlight the need for inclusion policies and initiatives to take into account issues around the quality of connections, including hardware specifications, such as the strength of routers.

When considering the type of connection provided within inclusion initiatives, it may also be worth noting whether connections have the capacity to be portable. This suggestion emerges from the finding that some students set up and used their router in locations outside the home. This was an unanticipated finding, as the routers were not primarily designed to be portable, particularly when compared to devices like dongles that are explicitly intended to be mobile. While not intended to be mobile, the 4G combined modem router provided in the program could be moved relatively easily as they operated via a SIM card rather than through a connection to a modem. For a few students, this was a valuable feature. For example, one student explained that they would bring the router to their family business during work hours, so they could complete homework while also being onsite to help with the business. This portability was also valued by students who lived between two households, or were in precarious housing, as they were able to consistently access quality and reliable connection in their living environments. This raises the possibility that in some situations, it may be preferable to provide similarly portable connections, rather than fixed connections. That said, the provision of fully mobile connections, like dongles, in future interventions should be considered carefully as the fact they can't be used across

multiple devices would preclude many of the broader household benefits outlined above.

Overall, these findings demonstrate that, beyond affordability, a quality and reliable connection is critical for ensuring digital inclusion and everyday participation. In this way, digital inclusion – and the quality and reliable connections that underpin it – can increasingly be considered in terms of welfare: a basic need that should be available to all. Approaching digital connectivity in this way has the potential to change the focus of interventions in this space, perhaps moving away from time- and context-bound initiatives, and towards an understanding that the capacity for connectivity everywhere and everywhen is critical.

4   Conclusion

Findings from the Connected Students program underscore the need for holistic and integrated digital inclusion interventions. It is not only a question of quality connection, but of quality connection plus adequate devices. Interventions that emphasise one without addressing the other will fail to fully achieve their intended aims.

Furthermore, it is not only about the digital inclusion of an individual, but the network effect of enhanced connection and device accessibility within, and beyond, the household. Interventions like the Connected Students program have exponential impact – they impact an individual and create flow-on effects within the home, and in doing so impact how members of the home are able to connect with and engage in the broader community. This highlights valuable opportunities to support individuals, households, and communities in participating more fully in digital contexts. Such interventions can foster greater agency for people across these multiple levels, supporting them to access and achieve the myriad benefits afforded by digital devices and connectivity. For low-income households, this is especially important in supporting their future earning potential and ensuring access to essential services and support organisations which are already available, and which are increasingly dependent upon online systems and portals (such as myGov, Centrelink, and Medicare). For low-income households living in rural and regional areas, this is even more crucial, as they may not live within reasonable proximity to bricks and mortar centres offering such services and assistance.

Relatedly, the Connected Students program has emphasised the value of research and interventions that focus not only on individuals, but the

broader household. By employing qualitative methods over a substantial period, this study was able to more fully capture the larger scale of benefits enabled by the program. Longitudinal engagement with households allowed us to better explore and record the value of this digital inclusion intervention for students and households over time and gain more nuanced insights on how such programs can be rolled out at larger scale in future. The value of an appropriate device plus quality internet connection over time became increasingly evident in terms of participating students' education engagement and outcomes, with some students reflecting in the final phase of interviews that this intervention was instrumental in their commitment to completing their high school education.

This more holistic and qualitative approach also helped underscore that people in low-income households are already aware of the vital role of connection within their homes, and parents are doing their best to obtain this for their children despite affordability barriers. The pervasiveness of smartphones and the increasing digitalisation of everyday life means that digital inclusion is less about whether people have the internet, and more about how they can access it, and the quality and reliability of their connection. This only became more pronounced throughout the COVID-19 pandemic, as education, employment, health, shopping, banking and many other domains of life were forced to transition online.

Finally, it is also important to acknowledge that having quality devices and connection are only one part – albeit an important one – of the broader picture of digital inclusion. Wrap around support is required to ensure that people can optimise and maintain the functionality of their connectivity, whether that be in terms of device speed or capability, connection speed and data needs, and, perhaps most significantly, the skills and digital literacies to make meaningful use of digital technologies as they continue to evolve.

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Digital Inclusion Through Distribution of iPads During the Covid19 Pandemic? A Participatory Action Research in a German Secondary School

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1 INTRODUCTION

Existing research on digital inclusion and digital inequalities points out to social inequalities in relation to gender, socio-economic disadvantages and cultural backgrounds (Livingstone & Helsper, 2007; van Deursen & van Dijk, 2015). As many fields of social life including education have been moved to the digital sphere with the Covid19 pandemic, these socio-digital inequalities crystallized even more. The inequalities in

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relation to digital technologies are related to access to digital technologies, skills and outcomes of digital media use (Livingstone & Helsper, 2007; van Deursen & Helsper, 2015; Ragnedda, 2016). Earlier research on digital divide focused mostly on issues related to access to the internet and hardware. As access rates started to increase, especially in industrialized countries, more recent research in digital inequalities moved towards the research of inequalities in digital skills and outcomes of digital media use. However, even in countries in the Global North, where the internet access rates reach up to over 90%, access inequalities still persist especially among socio-economically disadvantaged groups (Gonzales, 2016; Goedhart et al., 2019).

Many policies and projects for dissemination of hardware and increasing internet access have been carried out worldwide. This chapter focuses on a particular project for hardware dissemination that was developed in Bremen, Germany in 2021 to alleviate the negative influences of the Covid19 pandemic on education. All students in the elementary and secondary schools of Bremen were allocated iPads to mitigate the effects of unequal access to digital technologies and the internet on learning during the pandemic Focusing on one of the first schools, where the iPads were distributed, this chapter asks the question how far and under which conditions dissemination of hardware can contribute to attenuation of digital inequalities.

The chapter is based on a contextualized analysis of how a secondary school in a culturally very diverse and socio-economically disadvantaged secondary school in Bremen, Germany adapted to distance education based on the participatory action research project INCLUDED (MSCA, University of Bremen, 2019–2023). The fieldwork of the project continued for over a year before and after the outbreak of the COVID19 pandemic (January 2020–April 2021). The research design of the project includes participatory observations (online and offline), interviews with the teachers and focus-groups with the students as well as development and carrying out of teaching content together with the teachers at the school.

The chapter will firstly present how the teachers and students at the researched school adopted to the different phases of the pandemic between March 2020 and January 2021 focusing on the inequalities in the distant learning environments of the students. Secondly, the chapter will focus on the impact of the dissemination of iPads to the students in this particular school. The chapter will argue that the quick dissemination of hardware to

all the students was an important contribution to the improvement of their distance learning experiences. However, there were other factors such as lack of adequate learning spaces, lack of support and reduced well-being and lack of concentration that hindered students from actively participating in distant education.

2   Inequalities in Material Access to Digital Technologies

Inequalities in material access was the main focus of earlier digital divide research, which was often based on a binary perception of access to digital technologies as a matter of haves and have-nots (Livingstone & Helsper, 2007; van Deursen & Helsper, 2015; Ragnedda, 2016). As internet access rates continued to increase worldwide, the focus of digital divide research shifted towards second and third level inequalities (van Deursen & Helsper, 2015). However, we can see that access inequalities in relation to gender, education level, socio-economic background, rural and urban areas, disabilities continue to exist comparing different countries and comparing different socio-cultural groups within the countries (Hargittai, 2010; van Deursen & Helsper, 2015; Katz & Gonzalez, 2016; Ragnedda, 2020).

Furthermore, also the research on the first-level digital divide itself shifts from inequalities in physical access to inequalities in material access (van Deursen & van Dijk, 2019). The focus moves beyond the binary understandings of haves and have-nots of digital technologies and aims to capture the differences in quantity and quality of material access (Goedhart et al., 2019; van Deursen & van Dijk, 2019; Chen & Li, 2021). Gonzales (2016) argues that technology maintenance rather than initial access is one of the key issues for understanding digital divide today. Also the type of device used for accessing the internet determines the scope of internet use and its benefits (Napoli & Obar, 2014). For example, mobile internet access "offers lower levels of functionality and content availability; operates on less open and flexible platforms; and contributes to diminished levels of user engagement, content creation, and information seeking" (Napoli & Obar, 2014, p. 323).

van Deursen and van Dijk (2019) summarize these different dimensions of inequalities in material access under three points: "(1) differences in device opportunities, or the use replacement of a device by other devices

with different technical capacities; (2) differences in the diversity of devices and peripherals; and (3) differences in the maintenance costs of devices and peripherals" (van Deursen & van Dijk, 2019, p. 356). One additional point that needs to be considered in relation to access inequalities is related to the convenience, comfort, and autonomy of access (Chen & Li, 2021). For example, the use of public spaces that are less private and controlled by public authorities, the sharing of a digital device with parents and siblings, more generally spaces of media use do influence the functionality and content of the internet activities.

Also young people around the world are affected by socio-digital inequalities in relation to access, participation and outcomes (Hargittai, 2010; Wilkin et al., 2017; Helsper, 2020). For example, young girls and young people with disadvantaged young people often lack high quality and private access to digital technologies and are forced to more often use digital media in public spaces (Helsper, 2020, p. 443). Furthermore, although a high number of people are reported to be able to use the internet in countries in the Global North, the neighborhoods and the regional contexts also do play a role in the digital inclusion of young people in these countries (Katz & Gonzalez, 2016; Helsper, 2020).

Several national and international policies and hands-on projects up to today have been focusing on the mitigation of the access and device gap. One of the most well-known projects focusing on the issue is the international One Laptop Per Child project that was initiated in the Massachusetts Institute of Technology (MIT) in 2005 and provided 3 million educational laptops to children around the world (OPLC, 2021). The project caught a lot of attention from researchers and the public especially with its quite ambitious program and techno-utopian aim of "facilitating access to technology as a way to combat the educational gap with the most underprivileged children in the world" as they formulate it (OPLC, 2021). However, the effects of the OPLC project was not as straightforward as the project proposed in many contexts (Ames, 2016; Cristia et al., 2017; Yanguas, 2020). For example, drawing on her fieldwork in Paraguay between 2010 and 2013, Ames (2016) reports that children receiving the XO laptops distributed in the framework of the OLPC project, did not have a linear increase in their media literacy levels or school success rates. But they have been primarily connected children to music, videos, and games distributed by the transnational conglomerates (Ames, 2016, p. 95). Based on their survey study in Peru (N = 1909), Cristia et al. (2017) indicate that they could not find out any significant effects of the

distribution of the laptops on success in topics like mathematic and language. But they demonstrate that the overall usage of computers in and out of school contexts have increased with the use of the laptops (Cristia et al., 2017, p. 295). Yanguas (2020) similarly argues that the distribution of the laptops increased computer access among students in Uruguay, however, it did not really have an effect on educational attainment.

Also, national states have been investing public resources in technology access and infrastructure especially with a focus on educational programs. One example for this is the ongoing project DigitalPakt Schule that was initiated by the German Ministry of Education and Research in 2019 with a budget of 5 billion Euros in the following period of legislation (BMBF, n.d.).

The Covid19 pandemic leading to a transition to online education in a wide context made the issue of access inequalities a very visible topic again. Several schools, local authorities, activists, and local and national governments acted on the need to provide all students an equal opportunity to participate in online education during school closures. Receiving partial support from the DigitalPakt Schule program, the state of Bremen also acted with similar intentions and decided to allocate budget for iPads for all teachers and students attending primary and secondary schools in the region of Bremen as it will be discussed in detail in the following sections of this chapter.

3   Education and Digital Inequalities During the Covid19 Pandemic

The Covid19 pandemic had a tremendous effect on schools and education as school closures was one of the first measures taken against the dissemination of the virus around the world. Many schools continued education through different forms of distance education including the use of teaching portals, live meetings, emails, television and some even through letters and telephone calls. The wide use of digital technologies for distance education during the school closures due to the pandemic made it clear once more time that the students have very unequal conditions for participating in the digital society (Hüttmann et al., 2020; van de Werfhorst et al., 2020; Coleman, 2021).

One important issue here relating to the statistics on device ownership and internet access rates is that some of the young people, who are heavily

affected by digital inequalities are not sufficiently represented in the online surveys that are often chosen as the method of data collection (see for example Heller & Zügel, 2020 for the case of Germany). The Telekom study that was one of the broader studies on digital access in Germany during the Covid19 pandemic reports that 88% of the German households have access to computers and internet at home (Heller & Zügel, 2020, p. 7). However, online surveys risk underrepresenting people, who do not have access to the internet or who have poor quality devices and access. Furthermore, such studies do not take the quality and quantities of material access and the convenience and autonomy of the usage, which are influential factors for participation in distance education as discussed in the previous section. Therefore, we do not know enough about young people, who are disadvantaged due to their socio-economic status, cultural backgrounds, disabilities and the overlapping of these different factors. For example, Hüttmann et al. (2020) report for the case of Germany that young people with migration background, who also more often belong to socioeconomically disadvantaged households than the German average, demonstrate lower skills of computer and information literacy (p. 6). However, migration background itself is not a disadvantage per se and for example, children with migration background more often receive social support from their extended family members (Hüttmann et al., 2020). Thus, there is a need for more qualitative and contextualized analysis on the complex picture of possibilities and disadvantages that young people face as they are using digital technologies.

4   METHODOLOGY

The presented research is based on a participatory action research project that was conducted in a secondary school in Bremen. This school is in a culturally very diverse and socioeconomically disadvantaged neighbourhood of the city. Most of the students in the school or their parents have a migration background and come from families with lower socioeconomic status.

The analysis focuses both on the media repertoires of young people in their everyday lives and the integration of media in the context of the school. The research methods include focus groups with students in 8. and 9. Grades, interviews with teachers and participatory observations in the classroom context. Together with one of the teachers in the school, we also developed teaching content on media literacy education in the diverse

classroom context based on the preliminary analysis of the collected data. The aim of the project INCLUDED to analyse if and how schools can contribute to reducing digital inequalities focusing on a culturally diverse and socio-economically disadvantaged neighbourhood. For this purpose, the project analyses how students attending this school (7–9. Grade) use digital media for education and outside of the educational context and how digital media are integrated in the school curriculum.

The Covid19 pandemic influenced the field research and the research design of the project acutely. I started visiting the school for participatory observations in January 2020 and had conducted 3 focus groups with students and 2 interviews with teachers as the schools were closed mid-March due to the Covid19 pandemic. After this point, I started also following the developments in this school in relation to the pandemic, use of different methods during the school closures and the state of the distance education. Whereas I planned to conduct only one round of focus groups with the students, I changed my research design to include a second and third round of focus groups with most of the students to capture how they were dealing with the pandemic situation and distance education. The state of Bremen decided to distribute iPads to all students in elementary and secondary schools in Bremen in the summer of 2020 and this was an interesting development for the research project, which focuses on digital inequalities. I had done one round (two rounds with some of the students) of focus groups with the students before the dissemination of the iPads and then did a second round of focus groups with most of them three months after they had received the iPads and were using them for distance education. In total, I interviewed 47 students and conducted 10 semi-structured interviews with teachers and members of school administration.

The interviews and focus groups were transcribed and coded through a process of open and axial coding (Corbin & Strauss, 1990). The research data of the project covers a variety of topics including the integration of digital technologies in education, digital media use by the students for school purposes and outside of the school, the distance education during the Covid19 pandemic among other topics. This chapter only focuses on the context of the pandemic and the iPad project comparing students' participation in online distant education before and after the distribution of the iPads as well as students' and teachers' perception of the iPad project.

5   FINDINGS

The second round of focus groups in the Oberschule Bremen were conducted face-to-face in September 2020 shortly before the distribution of the iPad project to students and teachers. A third round of online focus groups were done in March 2021a few months after the students had received the iPads and actively used them for hybrid teaching and distance learning. The schools in Bremen were physically closed again between December 2020 and April 2021 due to the increase in the number of Covid19 cases and hospitalizations. This chapter presents the analysis of these two rounds of interviews before and after the distribution of the iPads focusing on the situation of material access among the students before the distribution of the iPads, students' expectations from the iPads, the distribution phase and the perception and concerns of the students while using the iPads for distance education and other purposes.

5.1   *The Bremer Oberschule During the Covid19 Pandemic*

The school went from complete school closures (March 2020 to May 2020) to reduced rotating classes (June 2020), and then complete opening (September–October 2020) to reduced rotating classes to complete school closures (Nov. 2021–April 2021). With the sudden school closures, the school did not immediately adopt a common policy for school closures and the teachers decided themselves, how they would contact the students and practice distance education in the very beginning of the pandemic, the school adopted a common policy of online live lectures after the dissemination of the iPads. The financier of the project was the federal state of Bremen and the federal project DigitalPakt Schule with a budget of 51 Million Euros (Kumpf, 2021). The aim was to provide 100.000 tablet computers for the teachers and students in the federal state of Bremen within the time period from September 2020 till December 2020. iPads by Apple were chosen as the device to be distributed in the project due to supply and security issues.

5.2   *Material Access Among Students and Distribution of the iPads*

The Bremer Oberschule as a school, which is located in a socio-economically disadvantaged neighbourhood, was one of the first schools

to receive the iPads in October 2020. The students, who participated in the focus groups, were asked which digital devices they had available at home. Most of the students had access to the internet through their mobile phones and followed the distance education through this during the pandemic. A few students reported not having a mobile phone or a smart phone with a capacity to use the internet efficiently. Only a few of the students had an own computer at home, where they could carry on education related tasks or some had a shared computer that they shared it with their siblings and/or parents. Because of this, some of the students had quite high expectations from the iPad devices I: What do you think about the iPad project?

> **Rojda:** Good! So I think it is good because I sometimes need something bigger than my mobile phone (…)
> **Atiye:** And I find it also good because my mobile phone is very slow and is going nuts really

Even when the students had access to the internet, the quality of the devices made a difference in terms of what they could do with these devices. Some students, as it can be seen in the quotes above, reported having older phones, which have very small screens or were very slow. Although students like Rojda and Atiye were responding positively to the distribution of iPads, there were also other students' questioning the aims of the project especially questioning the functionality of the iPads as it will be discussed in the section about the concerns of the students.

Quality access to digital technologies is not only related to the quality of the devices, which are used to connect to the internet, but also to the spaces available for using these technologies. Many students reported living in small houses and studying in rooms that they shared with several siblings.

> **Hazel:** So I find it a bit, so not so good, I find. I mean online. Because many have many siblings and a small house maybe. I mean it is the case for me. And because of this, I have to come to the school even.

For many, it was difficult to concentrate on distance learning in this small and crowded space and they were easily distracted. The Oberschule Bremen reacted quite quickly to this issue by enabling students, who did not have a proper space to study at home, to come to the school even

during the first phase of the pandemic. These students followed the online education in the buildings of the school during different phases of school closures. The school also very quickly reacted to the problem of access in the beginning of the pandemic by making all the laptops that the school owned available to some of the students, who had no means to participate in distance education. However, these devices were only available for a limited number of students and had diverging qualities.

The students were officially allowed to take iPads home and use them for educational purposes in the context of their homes, however, they were not allowed to install new apps. It was also not clear if they were allowed to use the browsers that were installed on the devices for searching for non-school related information or watching videos and series on video platforms. This was something that the students complained about, especially those who did not have a good alternative device for using the internet. It was also a concern among the students if they would have to give the devices back after the pandemic or after they finish secondary school as Rafael puts it for example: "I find it stupid, when I have to give it back because it is just absurd".

5.3   Use of iPads During the School Closures

The schools in Bremen closed again due to the peaking numbers of Covid19 cases in the region shortly after the students of Oberschule Bremen received their iPads. With the argument that all students were secured a device with the necessary software, the school made the attendance to online classes compulsory for all its students. The students followed a similar course plan to the in-person schedule of the school starting at 08:30 with classes and ending around 14:30 in the afternoon. The students' reactions to online live classes were mostly positive although some students complained about being very tired after sitting all day long in front of the screen or not understanding course topics as well as they used to in class. Hazel explains this as follows:

> **Hazel:** aehm, for me it is the case that I don't understand if the teacher is not standing next to me and explain it to me. I mean I don't understand the online, what the teachers are telling me and so on. And explain how an assignment goes and so on, for example. I mean, it is better for me in the school (…) But I find that online classes better than the time as the schools were closed the first time. Online classes are better because we could not ask

questions then. We maybe only received assignments. We could maybe send
a message.

Nihal: As we had the (telephone) numbers and so on.

Hazel: Or through Itslearning, but online would have then been better

Overall, Hazel indicates that she can learn much better in the classroom
setting in comparison to online environments. However, she also adds
that having online live classes was still much better than the self-study
period that they had in the beginning of the pandemic. She appreciates the
opportunity to be able to ask questions online.

For several students, one of the main problems in the first phase of the
pandemic and the accompanying school closures was the inability to struc-
ture the day. Many reported having severe sleep problems like not being
able to sleep until late hours and sleeping through the day. The online live
classes with a fixed schedule were a good response to these problems that
students faced, and many students developed a rhythm for following the
online classes through that. However, also in this period, one challenge
was the continuously changing schedules and regulations, the students
and teachers moved from face-to-face teaching to hybrid classes, then to
online classes and back to in-class teaching only within the timeframe of
4 months in the period from December 2020 to April 2021.

Although many students stated that they were happy to have a struc-
tured day again through the online live classes, some also complained that
sitting in front of the screen all day long. They also indicated that some of
the teachers sometimes tended to extend the classes as they are online,
something they could not do with the ringing of the bell as they were in
the school. One of the students stated that she finds the obligation to sit
in front of the screen all day quite contradictory to the general advice
about not using screens too much:

> **Sophie:** On the one hand, I find it practical, on the other hand, we are told
> that we should spend less time with technical devices and now we receive the
> iPads from the school. And then I find it that somehow there is a mistake
> here in-between. Why should I then look at the devices less, when it is
> allowed again for the school? (laughs) Because then we are also sitting in
> front of the devices, but just for the school.

Sophie rightfully asks if it is now allowed to sit long hours in front of the
screen because it is for education. She among many other students report

feeling overwhelmed and tired of the changes that came with the pandemic and also of sitting in front of the screens for long hours.

One issue that is not covered here due to the timepoint of the focus groups is related to how the iPads will be used for educational purposes after the opening of the schools. The state of Bremen also invests in the continuous using of the iPads and other digital technologies after the pandemic. The state has established a new directory under the Ministry of Children and Education for supporting digitalization in schools and offering trainings for teachers, who would like to use digital media more for their teaching practices (Stabstelle Digitalisierung). The mid-term effects of the investment in the iPads in Bremen remain open to be researched by future research.

5.4   Students' Concerns About the Maintenance of the iPads and Surveillance

Whereas the students mostly appreciated the opportunity to have interactive classes again, they were also mainly concerned about three issues related to the iPads. The first issue was about the responsibility of carrying these "expensive devices" and their maintenance.

> **Rafael:** (…) I ask myself, when it is broken, we have to pay for it then. (FG4)
> **Nihal:** Yes, this responsibility is not there. It would just be broken. For us, we are such a chaotic class, I can say that. Yes, I would be afraid myself that I let it fall. (FG5)

Many of the students in Oberschule Bremen come from households with low income and/or receiving social support. Taking the responsibility of an expensive device was a big concern among many of the students.

The second issue that was raised often before and after the distribution of the iPads was related to their functionality and affordances. Several students indicated that an iPad can mainly do the same things as a mobile phone and is not very functional. "A laptop could have been better" in this sense as it can be seen in the quotes below:

> **Maceo:** We do not really need it. If they just send assignments, it isa also possible on the mobile phone. It is just bigger. I find it unnecessary.
> **Leah:** I think for the money that apparently the ipads cost, we could have received something better. Aehm, I think even a laptop could have been

better, although you can carry the tablet better. But the thing is that you have the keyboard directly on the laptop. And especially no, where we should be applying for many things (internship), it (iPad) is unfortunately not something where you can write.

As Maceo and Leah formulate above, you cannot really write on an iPad without a keyboard. This would have been useful for writing applications for example, something that was an important topic for many of the interviewed students at the timepoint as they were applying for internships. Another student said that she would then herself buy a smart pen for the iPad, but then she does not know if she would be able to keep the device afterwards and she would not know what to do with the pen.

One last issue that was again discussed a lot among the students before and after the distribution of the iPads was related to issues of surveillance and data collection. Their main concern was not being watched by platforms or governments, but the teachers in school. As the students were handed their iPads, they were given detailed instructions on how to set a personal password on their devices to personalize and protect them from access by others. Yet, it was a big concern shared by many students as they could not be sure if the teachers were able to see everything that they did on their iPads. Mehmet, who presented himself as a quite technology-affine person in the focus group, was quite sure that this was the case:

> **Mehmet:** This is just absurd and what I find most irritating is that, when we have Lockdown, I cannot work anywhere because I know that it is being surveilled. I don't know. It does not work for me. So..
> **Maceo:** They will see what you do.
> **Alper:** Wallah? (really?)

Both Mehmet and Maceo's skepticism about the teachers' access to the devices that they use and Alper's surprised reaction show that students lack the knowledge about the possibilities of surveillance and data collection as they are using digital technologies on the one hand. On the other hand, they are concerned about being watched or about their data being collected and used by third parties as they also stated in other sections of the focus groups.

6   HARDWARE DISTRIBUTION A SOLUTION TO INEQUALITIES IN MATERIAL ACCESS?

This chapter focused on the issue of inequalities in material access to digital technologies among young people and if hardware distribution projects can be a solution to these inequalities. Based on the analysis of focus group interviews and participatory observations in a secondary school in a socioeconomically disadvantaged and culturally diverse neighbourhood of Bremen, Germany, the chapter presented a case of hardware distribution among young people as a reaction to school closures and distance education during the pandemic. This section aims to summarize and discuss the issues that this case study reveals in relation to the promises and limitations of hardware distribution projects.

Comparing the students' statements in the second round of focus groups with the third round of focus groups after the distribution of the iPads, we can argue that overall, the quick response of the federal state of Bremen investing the budget to provide a good digital device to all students was a successful strategy to mitigate the negative outcomes of the pandemic and the school closures. All students having the same device of course did not give them equal opportunities for participating in distance education. For example, some students did not have a quiet room to attend online lectures, others did not receive much support from their parents for educational tasks and some had additional responsibilities at home with the pandemic like taking care of younger siblings. Nevertheless, the devices did make it possible for the teachers to offer online live classes. This opportunity was appreciated by a lot of students as it helped them to structure their day and also to ask questions when they did not understand a particular topic.

The access to a functioning and good quality device was an important starting point for mitigating the effects of digital inequalities that influenced the possibilities of participation in distance education for the students of the Oberschule Bremen. However, it was mainly the pedagogical approach that the school adopted by offering a full-day schedule to the students and the possibility of interacting with their teachers recognizing their needs in the particular social and cultural context that the school is in. In this sense, as Facer and Selwyn (2021) argue there is no easy fix to digital inequalities. How technologies are adopted in a particular context (especially the pedagogical approach in the context of education) and

recognizing and responding to the needs of the people in a particular local context remain key to success of hardware distribution projects.

The functionality of the devices was another issue that was raised by the students. Some of the believed that the iPads did not offer many other functions than a mobile phone, which many of them already owned, except for a large screen. For many, who did not have a computer available at home, having a laptop or a similar device, which they could for example use to write job/internship applications, would have been a more efficient option. Another concern was related to the restrictions of not being able to use the devices for "non-educational" purposes. Several students did find a way to use the device for watching YouTube videos for example although the app was not pre-installed on the device. One question that needs to be discussed in relation to hardware dissemination projects in the context of education relates to what can be considered as an appropriate form of learning via digital devices. Students reported learning cooking, knitting, dancing or even writing through YouTube videos in the focus groups. They do also learn digital skills as they are playing around with digital devices. In this regard, moving away from rather narrow understanding of educational use of digital devices could open up new possibilities for formal and informal learning among students with the distributed devices.

Last but not least, there was a shared concern about surveillance by the teachers among many students. Some were certain that the information and the activities on these devices, which were distributed by the teachers and the school, could be accessed and seen by them. For this reason, they were worried about being tracked as they were using their iPads. This concern by the students not only points out to the need to inform target groups of hardware dissemination projects about the scope of the project and data protection while using these devices in detail while distributing the devices. But it also points out to a broader issue showing that young people are very concerned but not well-informed about data surveillance. Hence, they lack the data literacy to understand how and what kind of data can be collected and processed while using digital devices as they are using digital devices and how they can protect their privacy.

Presenting the findings of an in-depth case study of one particular hardware-dissemination project in the context of schools during the Covid19 pandemic, this chapter demonstrates that providing access is a necessary first step for digital inclusion. Providing high-quality devices to all students to reduce inequalities in participation in distance learning via

digital technologies during school closures was an effective reaction by the federal state of Bremen. But the students' responses also raise important questions about the functionality of the devices and their further use after the pandemic as well as concerns about data surveillance and overuse of digital screens. Thus, as private and public initiatives invest in hardware dissemination projects, there is a need for a multi-level response for alleviating the effects of digital inequalities in particular local contexts.

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Infocomics vs Infodemics: How Comics Utilise Health, Data and Media Literacies

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1 Introduction: The Rise of COVID-19 Comics on Social Media

During COVID-19 people's pandemic lives became deeply entwined with public health information, from instructional hand-washing infographics, to calls to 'flatten the curve.' Alongside authorial graphics produced by the world's biggest newspapers, the CDC, and the WHO, professional and amateur artists also created and shared public health messages online. These tackled everything from understanding the importance of rising R numbers to everyday public health behaviours such as how to effectively wear a mask and socially distance. In addition, these comics, shared across

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social media, covered a wide range of mental health and wellness topics, occasionally diving into broader issues of health equity and inequalities.

As U.N. Secretary-General Antonio Guterres warned, the world had to fight not only COVID-19, but "the growing surge of misinformation" (Lederer, 2020). Media literacy, in this moment, took on a public health role (see also McDougall et al., 2022), becoming situated at the intersection between fostering resilience to misinformation in general, and the immediate, exacerbated risk of exposure to misinformation on the virus. The widespread use of the term 'Infodemic' to describe the COVID-19 pandemic is a testament to this convergence. Social media researchers quickly spoke out about the possibilities - and perils - of public health communication over social media platforms like Twitter, Facebook, and Instagram (Chan & Purohit, 2020; King & Lazard, 2020). While some scholars noted that social media presents opportunities for health actors and governments to enhance data and health literacy by engaging millions of social media users, most research focused on monitoring and countering the flow of misinformation (Mendoza-Herrera, 2020; Johannsson & Selak, 2020).

Responding to this gap in the literature, our research study of 'covid comics' was designed to examine how social media platforms can be used to counter misinformation through the circulation of evidence-based and literacy promoting materials. Our aim was to offer insight into the roles that web-based comics can play for enhancing health, data and media literacies. By collecting, coding and archiving these dispersed digital artworks into a database, our project also set out to create a resource for developing health, data and media literacies, looking to improve creative, evidence-based media practices on social platforms like Instagram. In doing so, our approach utilises aspects of the 'third space' (Gutierrez, 2008; Bhabha, 1994), where existing, living literacies meet educational or developmental practices – in this case public health awareness. Resilient publics require conducive media environments which we can, subject to certain conditions, understand as third spaces. In these spaces, we can generate new knowledge about the potential connections between digital media literacy, communities, and public health—expanding the ways we imagine and utilise social media as a tool not only for countering misinformation, but for fostering health, data and media literacy through the creation of comics. Recent research into media literacy work in third spaces has developed a way of thinking about literacy of all kinds as dynamic rather than static (Potter & McDougall, 2016). This scholarship has

generated a set of transferable design thinking and working principles for this kind of activity, themselves visualised in a webcomic (Rega & McDougall, 2021).

2 Intersections of Web-Comics and Literacy

Across different fields, research has repeatedly shown that comics can help increase the effectiveness of communicating and comprehending scientific, health and related data-based information (Hawley et al., 2008; Green & Meyers, 2010; Czerwiec et al., 2015; Ashwal & Thomas, 2018; Farinella, 2018; Noe & Levine, 2020). Comics can effectively communicate risk factors, as well as social issues surrounding an illness. Readers can relate to events and experiences, connecting them to their own and creating empathy (McAllister, 1992). Many comics containing public health messages that emerged during the pandemic fall under the umbrella term 'graphic medicine', a concept that emerges from the intersection of the comics medium and healthcare. The term was coined by Dr. Ian Williams, a GP, writer, and comics artist (Green & Myers, 2010) and Graphic Medicine is now an organisation that works to further the practice and provide resources for artists, educators, and healthcare providers alike.

The term provides an umbrella term to bring together a growing number of comics that engage with healthcare, illness, disability, patient education, treatment and patient experiences, and practitioner experiences. Works classified as graphic medicine cross a variety of comic genres, including webcomics, graphic pathographies, informational comics, comics strips, single panels, and video/audio installations. Dr. Alexandra Alberda, a graphic medicine scholar on our team, summarises the reasons for why comics can work well for science, health and data communication around three key principles: comics are approachable, accessible, and relatable.

- **Approachable**
  - Prevalent in popular culture
  - Created and read in many cultures
- **Accessible**
  - Medium used in literacy training
  - Iconography represents local/regional/national identities
  - Effective visuals can get closer to meaning than text
- **Relatable**
  - Tells the human-side of a health issue
  - Builds communities

2.1   Comics Are Approachable

The familiarity of comics as a medium makes comics approachable. Comics are also approachable as the reader has control over how long they engage with the work. As opposed to videos or television, comics allow us to process the message at our own speed (Karp, 2011). Comics may make people feel "more focused and in control" and "less isolated and more hopeful" through this individual pacing (Green and Myers, 2010).

This structural aspect of comics also contributes to its potential for enhancing data-driven storytelling. Bach et al. (2017) suggest that making use of panels can help break complex processes into less complicated units, helping guide the reader through transitions. For example, panels in a data-driven comic story might be used to zoom out from specific detail to the broader context, or conversely as a way of drilling-down from broader picture to smaller detail.

2.2   Comics Are Accessible

Comics are likewise accessible in that they are usually presented in an easy-to-understand format. They often connect with readers by employing iconography that has a local, regional, or national identity, using recognisable images that can often get closer to meaning than text can alone. Because of their familiarity and ability to make information more comprehensible, comics have been found to be a useful medium for getting information out to the general public (McNicol, 2016, p. 25). As Farinella argues by combining metaphors and character-driven narratives, comics have the power to make scientific communications accessible to a wider audience (Farinella, 2018).

2.3   Comics Are Relatable

The unique combination of text and images found in comics is also what can make the medium more relatable than other visual and text-based media. Not only is it important that health information is depicted accurately, but that patient and family experiences are also represented fairly (Green & Myers, 2010; McNicol, 2016). Through using emotive stories, people can forge stronger connections with health data, helping them to make sense of their own personal experiences with a particular issue or illness.

3   Research Method

Our research method involved a three-step process. First, we engaged with practices of web-scrapping to retrieve social media data for analysis. Web-scraping is a popular method of data collection for researchers using social media content, and to collect our sample, we used Apify's Instagram scraper. While we originally planned to work with comics shared across different social media platforms including websites and twitter, we decided to focus on Instagram because of its visual prominence.

Bought by Facebook (now Meta) in 2013, Instagram is a for-profit, heavily commercialised platform driven by advertising revenue and the collection and sale of users' data. Organised around the display and sharing of visual imagery, Instagram now has more than 1.3 billion users worldwide – accounting 22.6% of all people aged 13+ in the world. The platform has become an extremely popular mobile app, particularly among 18–34-year-olds, who make up 62.8% of its users (Kemp, 2021).

As the current leading platform for visual content sharing, along with its ease of use, Instagram remains a prominent choice for posting comics content and connecting with readers. The social media platform opens artists' work up to new audiences through hashtags and the explore function. It allows artists to test out works in progress, gain immediate feedback from fans, connect with other artists, and gain commissions. During lockdowns, the importance of the platform for sharing work and connecting with audiences grew even more.

Our scraped dataset compiled 15,234 unique Instagram posts. Nine project team members worked to refine the original 15,234 dataset of Instagram posts to those that were 'in scope.' This was defined as posts that were comics in English that contained explicit public health messages. The refinement process left us with a sample of 3155 public health comics to code. These posts were then qualitatively coded by five project team members, after which we were left with 3130 public health comics.

Comics were sourced from just over 1000 unique users on Instagram; however, the distribution clearly resembled a long tail, with 20 artists contributing 25% of the total number of comics analysed. For data on visual and storytelling elements, we filtered out reposts, leaving a sample of 2340 original comics. Comics came from all populated continents. Of the comics with a clearly identifiable country of origin (just under 60% of the sample), nearly half came from the United States, with the UK at 15%, and India representing the third largest contribution with 8%.

While most researchers that use web-scraping methods aim to produce academic findings, our aim was to re-curate social media data to make this data differently accessible for content creators, stakeholders, and the public. To do this, we developed a process we call 'coding as tagging'. Here we re-imagined traditional content analysis through the co-creation of 'stakeholder folksonomies' - categories relating to health and data literacy topics - that we then used, via coding, to 'tag' social media posts. This process transformed what would be a standard academic dataset into a searchable database that can become a publicly re-useable resource.

In the final step of our method, we directly contacted comics artists in our sample via an 'opt-in' participation process. This stage served to share project information and provided an opportunity for artists to self-represent by sharing biographical information and further links that we could include in our research dissemination. Together, these three steps offer an innovative, participatory approach to data-driven communications research.

4   Findings

In the next section of this chapter we look at findings from our study as they relate to (I) health literacy, (II) data literacy, and (III) media literacy in relation to creative social media practice.

4.1   Health Literacy

Existing research shows that using visual metaphors in comics can help facilitate the communication of complex health information and scientific concepts (Farinella, 2018; El Rafaie, 2019; Saji et al., 2021). Our study adds evidence to this argument, finding that visual metaphors were used in nearly one out of every four public health comics. Comics using of visual metaphors performed well in terms of audience engagement, as measured by like counts. Among the 10 most 'liked' comics tagged in the genre of 'infocomics' within our sample, 8 used visual metaphors. This suggests there is a relationship between the use of visual metaphor and engagement with public health messages on social media.

Visual metaphors are particularly useful when communicating health concepts that are otherwise invisible (Callender et al., 2020). For example, many artists in our sample drew COVID-19 as a monster or villain to visualise virus behaviour. This comic made by @elfylandstudios in

collaboration with @lifeologyapp (see Fig. 8.1) features COVID-19 personified as a monster to illustrate the virus' properties and behaviours for young audiences. Here, reimagining an abstract concept using familiar cartoon iconography helps to translate complex health information using a more recognisable visual language.

In the caption for this comic, artist Elfy Chiang writes, "This is a comic I made with @lifeologyapp and experts in virology. Created to help adults talk to little kids about the pandemic and help them make sense of the changes in our daily lives right now." In a recent study, Saji et al. (2021) argue that such anthropomorphic metaphors "capture the existential experiences of the self and the bestial nature of the virus" (p. 152).

Fig. 8.1 Comic by Elfy Chiang in collaboration with Lifeology. Follow Elfy on Instagram @elfylandstudios

By depicting the virus as monster, comic stories can visually frame the 'battle' against COVID-19 as one that is collective and empowering, demanding society to fight the metaphorical beast. In our sample, one third of comics using visual metaphor also used elements from the superhero genre to depict their public health message. Superhero genre comics that clearly featured human characters battling the virus depicted mixed gender groups 40% of the time and mixed age groups 20% of the time. Even though, younger and mostly male depictions of superheroes follow the common stereotypes, the transgressive potential of comics can be seen in these comics that include mixed age and gender representations.

Comics can help communicate COVID-19 experiences from the perspective of vulnerable and/or marginalised people raising greater awareness for issues of health equity. The WHO defines health equity as the influence that non-medical factors have on health outcomes. For example, this can include income, education levels, job insecurity, food, housing, social inclusion, access to affordable health services, as well as policy systems (https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1). Fostering empathy and care for others' wellbeing is a key component of effective public health campaigns. Comics can be a powerful medium for evoking emotions and empathy, which in turn can support prosocial behavioural change by shifting perspectives and attitudes (Pfattheicher et al., 2022).

As our sample showed, this can be done either by creating relatable characters in comics centred on conveying information (infocomics), or by telling character-driven stories that prompt the reader to reflect on how individual experiences might be systematic or play out on a broader, social level (e.g., slice of life, testimonial, political comics). For example, in Fig. 8.2, originally posted by _coronadiary, the #unheardcovid series showed experiences of people who have been 'left out the conversation' during COVID-19. In this special collaborative series #unheardcovid, Jackson used composite characters to represent people that are often left out of public narratives around COVID-19. For this project she partnered with @risingartsagency. Together, they responded to the question: Who is left out of the conversation? "I asked followers for feedback and there was a lot!" Jackson explains on her Instagram account, "I picked 9 answers then spoke either directly to people who identified under these categories or alternatively found online quotes from those in response to the pandemic" (https://www.instagram.com/p/CG2rDpsFQNY/). The series includes a teacher, a pregnant person, a child, a homeless person, a medic,
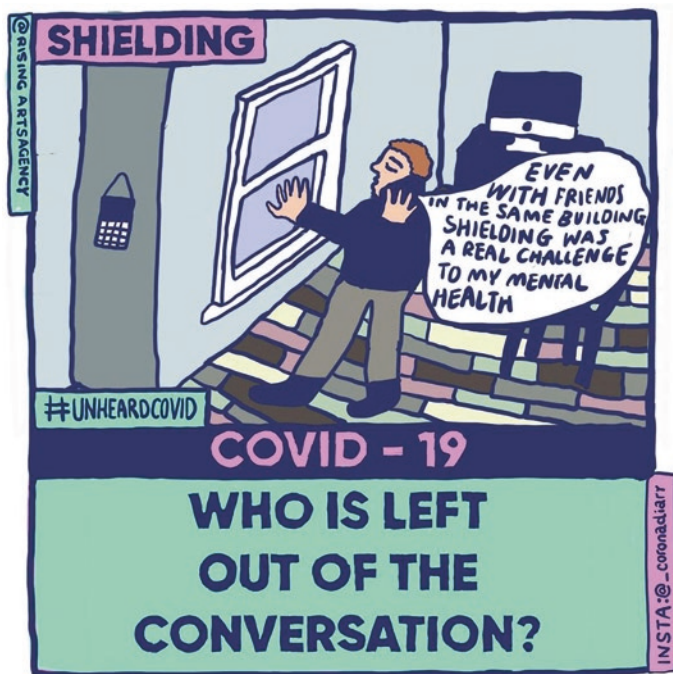
Fig. 8.2 Panels from Monique Jacskon's #unheardcovid series, follow Monique's work on Instagram @_coronadiary (https://www.instagram.com/p/CHK1piYl6qj/)

a disabled person, an evicted migrant, someone with long COVID, and someone shielding.

Jackson's illustrations bring these demographic categories to live through the creation of relatable characters. This practice can help foster empathy for those different from ourselves. This visually engaging, humanising approach to communicating marginalised experiences invites the audience to consider the pandemic from a perspective different to their own, and relatable character illustration humanising the impersonal, numerical data often presented in the news. Comments left on the series' posts displayed support and empathy for those in each situation. "Financial support for all of the people in this position is so crucial! Horrible to think of people forcing themselves back to work too early." and "Love your [sic] looking after those who are neglected thanks for your important work!"

Further analysis and audience reception research should be done to investigate visual metaphor as a tool for rapidly communicating complex public health information to non-specialist audiences.

4.2   Data Literacy

The increasing popularity of comics and data comics can be leveraged to amplify the circulation of authentic health information in ways that help build not only health literacy, but also data and information literacy. Creating a culture of good evidence-based communication practices among comics artists can help counter misinformation online and improve information literacy. As in mainstream reporting, crediting sources of comic data for health information and data in comics to expert sources like the CDC and the WHO have been found to be effective at correcting health misinformation on social media (Vraga & Bode, 2017). Moreover, by repeatedly referencing authorial sources in their public health messaging, and developing a reputation for offering verified information, comic artists can become science communication influencers whose messages can trigger adoption through positive social reinforcement (Zhou et al., 2015).

In our dataset of comics, sources were referenced in only 10% of comics, with only half these references citing authorial sources. Good referencing and authorial source citation practices were most common in infocomics. Promisingly, of the top 10 users with the most liked infocomics, the top 3 all engaged with authorial source referencing practices.

Failure to reference does not rest with the artists alone. Instagram has several platform constraints that makes it challenging for users to establish credibility for their posts. For example, Instagram has a 'no-clickable-link' policy in posts. The platform only allows for one link that users must put in their profile bios, making it challenging for this to function to be used as a post reference. While these policies are useful for preventing spam and countering online scams, it makes it challenging for artists to include links to authorial and evidence-based sources in their comics.

In response to this platform constraint, some artists put URLs in their images or captions to lead followers to health authorities as a way of establishing authentication and countering misinformation with their comics. Such effort is frustrated by the fact that the URLs do not appear as hyperlinks when posted, and often cannot be copied and pasted from Instagram's mobile app, making it difficult to follow the link to its source. Whilst not ideal, sharing references visually and noting authorial sources through @

mentions are important for establishing chains of accountability and generating trust with both readers and public health professionals.

Our data highlights the need for further research into referencing practices as a potential force for countering misinformation on visually based social media. It also calls for more training and resources to be put into supporting communities of practice around evidence-based artistic practice. At the same time, our findings suggest that it should be the responsibility of social media platforms to enable and foster evidence-based communication online. Better practice in source verification can be embedded into platform design. For example, users could be prompted about referencing and fact-checking practices in the same way that platforms now inform users about third party data and personalised advertising through interface pop-ups or 'more information' buttons.

In her comic on how COVID-19 spreads, artist @weimankow (see Fig. 8.3) embeds references to the CDC and WHO in this comic panel and credits a medical expert who vetted the health message in the comic by using an @ mention in the caption box. Another comic in our sample by Monique Jackson (@_coronadiary) (see Fig. 8.4), draws attention to the lethal impact of COVID-19 to counter the myth that it is just another seasonal flu. Providing an evidence-base for her comic, Jackson visually references a scientific paper from The Lancet which compares data from COVID-19 and the seasonal flu.

One of the most challenging issues for science communication is how to handle uncertainty. As data and charts became part of our daily lives, people were repeatedly asked to see themselves against the pandemic's health statistics, graphs, charts, and changing projections. We were called upon to continuously evaluate and re-evaluate numbers and figures, while also constantly being told that the figures were estimates, the data was incomplete, the projections were contested, and correct case and death counts were unknown.

This data uncertainty was deeply entangled with the larger uncertainties of pandemic life. In addition to the mental health and wellness impacts of the social and economic factors of the pandemic, this uncertainty itself has led to increased mental distress (Bryce et al., 2020; Koffman et al., 2020; Rutter et al., 2020). 'Stuck in fight or flight mode', the cognitive psychology language of trauma has entered popular vocabulary as people struggle to navigate life amid so much uncertainty. It has become clear through the pandemic that we have a lack of language and resources for handling so much of it.

Fig. 8.3 Comic by Weiman Kow. Follow Weiman's work on Instagram @weimankow (https://www.instagram.com/p/B_aN_VxHP8j/)

In our sample of comics, only 3% addressed issues of uncertainty, yet 3 of the top 5 most commented on artists addressed uncertainty in their work. In addition, the most prolific artist in our sample, @drmaypole, expressed uncertainty in 30% of his comics, which were often drawn from his experiences interacting with patients, and children, as a doctor during the pandemic. Comics addressing uncertainty were most prevalent in the infocomics genre where scientific uncertainty around safety protocols, testing, and vaccination was contextualised and explained, as well as in 'slice of life' comics where uncertainty was expressed in relation to mental health. Humour was also used to navigate uncertainty, acknowledging both shared states of anxiety and shared frustrations in governmental guidance.

Fig. 8.4 Art by Monique Jackson. Follow Monique's work on Instagram @_coronadiary (https://www.instagram.com/p/CJ6xVi8l1sN/)

For example, in September 2020, cartoonist and hospital administrator Katy Doughty (see Fig. 8.5) created a web-comic called 'We Might Not Ever Know the True Toll of COVID-19' (https://thenib.com/the-true-toll-of-covid-19/). As part of her hospital job, Doughty was responsible for updating her hospital's online COVID-19 guide. Her web-comic illustrates her reflections on the messiness of COVID-19 data and its collection. In one stark panel the bars of a bar graph tumble and fall over each other like the planks of a broken fence. Some of them fall into a blood red mound at the bottom of the graph, paired with the caption "The truth is COVID-19 statistics are a mess." Doughty's sombre text relates the struggle of keeping up to date with the death count.

Fig. 8.5 Panel excerpts from Katy Doughty's comic We Might Not Ever Know the True Toll of COVID-19 published on The Nib. Follow Katy's comics on Instagram @katydoughtydraws (https://www.instagram.com/p/CFaUaxBjhnG/?utm_source=ig_web_copy_link)

Two panels show neat rows of hospital beds. The first filled with blank outlines of bodies reads: "Most case statistics in the U.S. don't include information about race and the CDC had to be sued before releasing the data that they do have." The following panel shows the same scene, this time the beds are filled with black and brown bodies. Here the paired caption text narrates, "The data is sparse, but damning. Latinx and Black people are three times as likely to get COVID-19 as white people, and twice as likely to die from it."

Doughty's sequential artwork on the statistical chaos of COVID-19 uses a stripped back colour scheme, resonant iconography, and layers of text to convey the contrast between what we see on the 'data surface' versus the realities behind the scenes. Doughty's comic legitimates the human experience of chaos, while making visible data that is absent, uncounted, or hidden. Most importantly, it does this in a way that spotlights—rather than shies away from—the systematic failures and vulnerabilities revealed by all that what we cannot yet count.

Sometimes the best thing that can be done in times of uncertainty is acknowledge it. Recent research by Van Der Bles et al. (2020) found that "a key challenge to maintaining public trust in science is for communicators to be honest and transparent about the limitations of our current state of knowledge." Our findings suggest that comics can serve as a medium to help health professionals and scientists communicate uncertainty in ways that are engaging and accessible to social media audiences. Further research is needed into effective strategies for communicating scientific uncertainty and utilising social media as a forum to build resilience in uncertain times. Returning to the concept of the third space, our findings suggest that these dynamic practices of engaging with data and its shortcomings can enhance media literacies, particularly in relation to not only consuming, but creating, sharing and interacting on social media.

4.3   *Media Literacy*

In the context of an 'information disorder' (Wardle & Derakhshan, 2017) media literacy research, practice and activism increasingly resists binaries between authoritative and 'fake'. More critical, capacity-building and dynamic media literacy work tends to facilitate healthy cynicism about and resilience to all media in combination with the capacity to act through the collective, civic uses of such literacy practices (Hoggart, 1957, Bennett, McDougall and Potter, 2020). The 'state of the art' of the media literacy field presents this shift from competence frameworks to a negotiation of dynamic, experiential, and reflexive media literacy practices. This shift responds to the urgent need to understand how literacies are impacted by and, in turn, impact on social media, data and algorithms.

The UNESCO declaration on media literacy is over-arching and includes all aspects of digital media literacy (DML). The declaration is regularly updated to take account of global issues and the most recent update situates media literacy as a 'defence against disinfodemics'

(UNESCO, 2020). This foregrounds media literacy as a first response to information disorder - the combined effects of online misinformation; mainstream media disseminating 'poor quality information' through the web; weakened local media reducing diversity, the narrowing scope of media representation undermining democracy; the use of data for demographic targeting and the deployment of 'bots' for large-scale viral circulation of misinformation.

Austin et al. (2021) applied an established media literacy assessment model (NAMLE, 2007) to test the hypothesis that, as media literacy enables agency in information environments, media literate citizens would be better placed to interpret emerging health information in a time of crisis and develop self-protective behaviours, finding that "Individuals with more media literacy are better prepared and willing to take experts' recommended preventive actions." (Austin et al., 2021: 11). This intersection of media literacy, COVID-19 and citizen action locates media literacy during and after the pandemic as being more about citizens interacting differently with media ecosystems. This is an active shift in thinking about the agentive uses of media literacy. Rather than assuming that media literacy competences can be measured as 'more or less developed' and then, once develpoed, assumed to lead to both communicative resilience and capacity to make positive change in themselves, this way of thinking separates competences from capability. Our theory of change for media literacy then goes further still to link capability to the consequences of actions – behaviour change in the ecosystem – and to look for positive uses of media literacy for social justice, beyond both competence and resilience.

Research into how media literacy relates to the capacity to interpret health (mis)information during the COVID-19 crisis, including this study, investigates the visual representation of COVID-19 information across social media platforms and various forms of response to the cultural politics of data. Musi and Carmi (2020) contribute a 'crisis informatics' approach to global digital activism in times of COVID-19. The methods 'reverse-engineer' COVID-19 misinformation, a form of 'mining back' data. This new and emerging sub-field of media literacy research focuses on the power that citizens have to respond to misinformation. Our research shares this ethos. We argue that critical engagement with social media content creation – from understanding platform optimization to the operation of their algorithms – can contribute to our methodological

and conceptual approaches to literacy as dynamic and interdependent on (social) media ecosystems.

Digital optimisation refers to the practice of improving content production processes to increase digital visibility and engagement. Understanding how digital optimisation works on different platforms is now crucial for developing media literacy and becoming a reflexive content creator. All social media platforms have limitations on how content can be posted and shared. Learning how to navigate these parameters is essential for maximising the efficacy of public health messages on social media. In relation to optimising comics and related visual material for Instagram, there are two major areas that need attention - how to overcome aesthetic limitations, and how to overcome algorithmic limitations.

Optimisation on Instagram involves considering how art will translate into Instagram's square single-image and 10-image slider formats. Abiding by the Instagram square is useful for content creators as it ensures that the image fits within the mobile app layout. Users often access Instagram on mobile phones, which means they view the content through smaller screens which can result in decreased readability if the comic does not fit within the optimum aspect ratio.

Instagram allows for a 4:5 aspect ratio for portrait images and 1.91:1 for landscape. However, the optimum size for the platform is 1:1, commonly called the Instagram square. Any image that is larger than these aspect ratios automatically gets cropped in order to be uploaded onto the app. Instagram also offers a slider function that allows for up to 10 images to be uploaded in a single post. In posts that use this function for multiple images, users are still limited to a fixed aspect ratio, where the aspect ratio used in the first image needs to be maintained across all images in the same post. Here, again, the 'Instagram square' format is best suited to the platform.

Whilst still limited, the slider function on Instagram allows a maximum of 10 images in each post, providing opportunities for artists who wish to share content that does not fit within a single square image. The standard practice used by most Instagram-based comic artists is to post either a single image with no more than four comic panels, or to present each comic panel as a single square and use the slider function as a way for readers to follow the narrative progression. In comics that use the slider function, the swipe becomes akin to the gutter in a traditional comic panel layout.

In our dataset, the majority of artists opted for square format and single image posts. We found that 53% of posts were a single image, with 67% of posts using a square panel format. The second most common format was a four-panel comic that either opted for 4 squares within a square layout or a slider of 4 individual panels. Ranked by engagement data, the 10 most-liked and commented-on artists opted for square panel layouts over 90% of the time, with just under 50 of their posts being single images. The number of panels used varied from 1 up to 19. Among the top 50 most liked and commented on posts, over 75% of posts included square panels, with 42% being single image posts. Again, the number of panels varied, here from 1 to 22.

Insights from this data show that the Instagram square is key to visual optimisation and engagement with public health comics, as is scaling text and visual iconography in way that it remains legible for reading on mobile devices. Yet, while the scarcity of attention online and the need to grab audiences quickly should be considered, in our findings, reader engagement was not limited to single image, single-panel posts.

This suggests that various approaches to sequential storytelling can drive engagement, meaning creators have room to give some depth to characters, explain more complex data or breakdown information over the course of multiple panels and images. It also suggests that when comics can create an immersive, connective reader experience, it may be able to stand out in an over-saturated, visual information environment (Wolf, 2014). Further research into audience engagement, attention span, and the potential of visual, sequential storytelling on social media is needed.

The strategic use of hashtags are also a part of developing social media literacy. Hashtags can increase social media attention to public health messages. Hashtags on social media platforms are used to make content searchable (Zappavigna, 2011). By segmenting content into specific topics, hashtags enable people who are interested in a subject to come together. As a content creator, they are one of the best tools to help ensure posts reach your target audience. For example, in the COVID-19 comics we analysed, we saw this in the use of hashtags such as "#quarantinelife" where the posts containing the hashtag aims to share relatable experiences for those who are in quarantine at the same time.

However, the use of hashtags varies heavily amongst Instagram users (McCosker & Gerrard, 2020). For instance, hashtags are often added to an image that further describes or amplifies its message but does not necessarily aim to open a space of discussion or reach specific target audiences

(Highfield & Leaver, 2015). This can be seen in our sample through the use of trending COVID-19 hashtag lists, such as #wearamask, #staysafe, and #stayathome. While these public health directives may work to reinforce official messaging, they often only reach users who already share a similar point of view.

Recent research increasingly provides evidence that users can encounter opposing viewpoints in online spaces despite algorithmic curation and personalisation which was previously believed to trap users into homogenous filter bubbles (Messing & Westwood, 2014; Dubois & Blank, 2018). This suggests that online spaces do indeed create opportunities to reach those who are sceptical or unaware of public health messaging. For instance, research shows that during the pandemic over 60% of Instagram users surveyed were using the generic hashtag #coronavirus to share information about the pandemic (Rovetta & Bhagavathula, 2020). This is in line with what we observed in our dataset.

Drawing insight from this data, we would suggest that in order to further instigate behavioural change and raise awareness on Instagram, directive hashtags such as #wearamask should be used in combination with trending, generic hashtags that are more likely to circulate in communities beyond one's existing belief system. In addition, Rovetta and Bhagavathula (2020) point out that generic hashtags are frequently used by those spreading misinformation. This suggests that using such hashtags may help reach audiences that are more sceptical about public health information. Further research should be done to see how hashtag use in evidence-based visual media like comics can provide opportunities to interrupt and disrupt flows of misinformation on social media.

Another practice that can be used by social media content creators to widen audiences is using location-specific or audience-specific hashtags. Several posts in our dataset utilised hashtags such as, #coviditaly, #coronavirusgermany, #covidmalaysia to signal the relevance of the message by country. For example, James Fulmer MD (see Fig. 8.6), uses both various hashtags relevant to certain countries, as well as hashtags such as #emergencynurse, #criticalcarenurse and #icunurse to signal specific occupational audiences that may find this content relevant. He also uses #graphicmedicine, linking his work into an existing community of health-based comics creators, scholars, and fans. Fulmer hashtasgs the post #facemasks rather than the directive #wearamask, as well as using a string of COVID-19 generic hashtags like #covid, #covid19, and #coronamemes, providing a good example of how to use a more generic hashtag list in
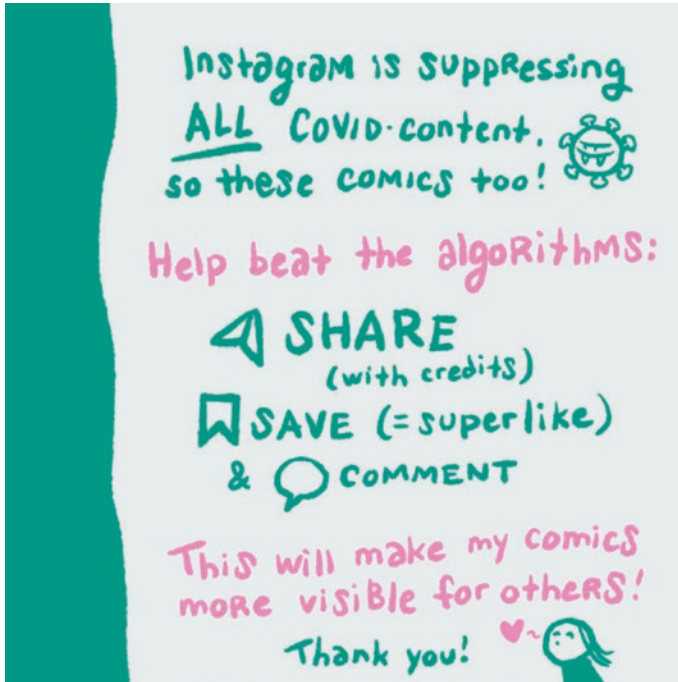
Fig. 8.6 comic by James Fulmer MD. Follow James' comics on Instagram @ doctorwarsgame (https://www.instagram.com/p/B97j-f7hjyg/)

efforts to reach a wider demographic. General social media advice for using hashtags on Instagram varies from 3–5 to up to 30.

In addition to hashtags, another key element of building (social) media literacy is developing skills in working with social media platforms' interactive functions in ways that promote evidence-based communication and empathy. Interactivity on social media refers to messages that prompt the audience to share their experience or perspective in response to a post. In our sample, these kinds of interactivity prompts appeared either within a comic panel or in the post caption box. While interactivity was only used in 15% of the comics in our sample, 11 of the top 25 users with the most comments used interactivity in their comics, their captions, or both.

Analysing the comments on posts that included interactivity shows the potential that interactive social media engagement can have for building

deeper understandings of public health issues. While the negative impacts of online comments are well documented, we found, in line with recent research, that the comments sections of public health comics can become deliberative spaces where people share experiences and discover new information or resources (Andalibi et al., 2017).

In our sample, the comments sections of comics that included elements of health literacy, provided opportunities for readers to share opinions and ask questions. This can help increase comprehension through personal engagement and make health and scientific information more relatable, which contributes to information comprehension and retention (Martin & MacDonald, 2020). Comments are also useful spaces for artists to add further nuance to information shared in the comic and address reader questions.

By addressing people's scepticism, dialogue in the comments section of comic posts can offer a place to examine and accept scientific uncertainty. In efforts to counter scaremongering in the comments, in one post artist Maaike Hartjes pointed her readers to preliminary scientific results. In the comments section of two of Hartjes' other posts featuring vaccination comics, several people declared that the comic led them to better understand how the vaccines worked and one person claimed that this artist's comics convinced them to take the vaccine. In another set of comics about restrictions, people from many different countries used the comments to discuss and make sense of their own country's way of dealing with the pandemic.

Artists' dialogues with readers show us that when artists are willing to engage with fact-checking and respond to queries, they can build health literacy together. While artists are of course not authorial sources themselves, these nascent findings point to the potential impact that collaborations between artists and health organisations could have. Combining the accessibility and relatability of comics with the interactivity afforded by social media could prove a fruitive ground for challenging mis/disinformation. Further, this combination of accessibility, relatability and interactivity works to support the four elements of media literacy (see BBC Media Actiion, 2022). These are access (to health information); awareness (of how public health is represented and the need for diversity); capability (to reflect on the impact of covid on the inner world) and consequences (more mindful engagement with data and sharing behaviours). Approaching media literacy through this case study of comics lets us see how people can transform their existing literacies into the capability to make informed

decisions about public health. This focus on media literacy developing into broader social and civic capability is informed by the work of Sen (2008).

Finally, digital optimisation can also mean knowing how to navigate restrictions that are put in place by platform algorithms. How much visibility a post gets can be determined through engagement (i.e., the more comments and likes the content has, the more it is amplified), or through hashtags and mentions that notify the algorithms about who might be interested in seeing a particular content. Algorithms are also used to find content and accounts that breach terms of service or copyright laws. Platforms may additionally choose to suppress certain content that they deem harmful by reducing its visibility and reach. This can include banning hashtags or accounts, which has become a popular method of fighting the proliferation of fake news and misinformation in recent years.

However, algorithmic interventions that aim to suppress mis/disinformation can sometimes result in the suppression of evidence-based informational posts on the same topics. In late 2020, in an attempt to curb misinformation, Instagram changed its rules around COVID-19-related content in order to suppress posts that were not shared by an authorial health institution. Users were directed to the WHO's Instagram account when they searched for hashtags about COVID-19 and posts that contained COVID-19 related information were marked with a banner that alerted the viewer to a local public health authorities' website based on their location.

In relation to our study, these attempts to curb misinformation meant that comic artists who were aiming to increase health literacy by explaining complex medical information were also being targeted by Instagram's algorithm. This resulted in the suppression of their posts. The content was sometimes flagged, left out of post feeds, and reached fewer users as a result. In response to this algorithmic limitation, some artists started to mobilise their followers on Instagram, employing grassroots attempts to 'trick' the algorithm by urging their followers and viewers to like, comment, and save posts to amplify their reach. For example, in a post explaining the differences between COVID-19 variants and mutations, artist Maaike Hartjes explains how readers can help make artists' work on COVID-19 more visible. Here, Hartjes helps foster a community of practice around supporting artists on social media at the same time as she tries to build literacy, not only on COVID-19, but also on the ways that a platform algorithm works (Fig. 8.7).

Fig. 8.7 Comic by Maaike Hartjes (https://www.instagram.com/p/CKv60QPlSmF/)

5 Conclusion and Policy Recommendations

Regarding the contribution this study makes to the field of media literacy, we know that media literate people are more able to make informed decisions about issues that affect their lives and have greater resilience to information disorder. By applying a theory of change for media literacy, linking access to awareness to capability and consequences to the efficacy of web-comics for 'third space' public health, we have found that:

- Public health web-comics address information ecosystem challenges by making a positive contribution to the diversity of the system and increasing trustworthy content;
- Public health web-comics have the potential to convert media literacy into a broader capability through inner world reflexivity; representations of mental health and media texts interacting with audiences' 'living covid literacies' in real time;
- Public health web-comics can combine this capability development with positive consequences and behaviour change, through more mindful engagement with data and a reduction in sharing information without thinking.

Based on the findings arising from our research, we put forward the following recommendations.

1. Best practice in public health messaging should combine visual storytelling and referencing techniques through dynamic 'third space'

approaches that acknowledge the existing literacy practices of their audiences.

2. Communities of practice should be further developed to investigate and enhance creative, evidence-based communications on social media. This includes bringing visual metaphor, resonant icons, gesture, experiential scales, and internal emotional worlds into the visual communication of scientific and statistical reporting, as well as training in data referencing and social media optimisation skills.

3. Public Health bodies should work with comics artists on the creation and distribution of public health messaging campaigns. These collaborations are often most successful when artists can tap into their existing reader networks and retain ownership over their creative work.

4. Social Media platform regulation should focus not only on supressing and flagging dis/misinformation, but also on helping to tag and amplify evidence-based posts. For example, a "green tick", similar to the "blue tick" used for verified public figures, could be used to verify the credibility of science communicators.

5. Platform regulation should be combined with strategies to strengthen people's resilience to health misinformation through media literacy, taking the transferable principles from how comics combine accessibility, relatability and interactivity to support the conversion of existing literacies into information capabilities.

6. More work at policy level needs to be done to achieve free access to social media data. Corporations like Facebook (now Meta) have failed to preserve visual archives. They do not make data easily searchable or accessible to researchers, limiting our ability to study social phenomena and preserve digital cultural heritage.

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Digital Literacy: Creativity, Civic Participation, and Capabilities

CHAPTER 9

Creating Creativity for Future-Proofing Digital Engagement, an Evidence Based Approach

Josie Barnard

1   INTRODUCTION

Creativity may be the single most important skill in our increasingly 'online' society. Pre-Covid, it had already been established that creativity is key to the acquisition of 'future-proofing' digital skills (Barnard, 2017, 2019a). Through 2020 and 2021, 'lockdowns' forced by the Covid pandemic brought wider attention to the value of creativity in the context of digital upskilling.

Digital inclusion research and policy has largely centred on provision of online access, equipment and/or technical training, with the misguided idea that these on their own can 'solve' the problem of digital exclusion (Carmi & Yates, 2020; Allman & Blank, 2021). Access in isolation can leave non-users baffled and little closer to meaningful digital engagement (Allman & Blank, 2021); technical skills alone may put partial users in

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harm's way (Livingstone et al., 2021). A fundamental problem in the digital realm is the sheer pace of technological change. Manufacturers' software updates alter digital engagement on a regular, even daily basis. Morphing issues such as 'fake news' mean that how we define 'digital literacies' is continually changing (Carmi & Yates, 2020). A "seemingly comprehensive set of new technological skills could soon be obsolete, [we] must prepare for technologies that have yet to be invented" (Barnard, 2019a, p. 1). That is, even with access and basic technical skills in place, 'digital' is a moving target. Yet, suddenly, in 2020, due to Covid 'lockdowns', extensive digital engagement was effectively mandated in societies across the world.

In the UK, the first lockdown began on 23rd March 2020 (IfG, 2021). Travel was restricted and for many, working from home was made compulsory. In order to conduct a simple bank transaction or join a work 'Zoom' meeting, within days, millions had to digitally upskill. COVID lockdowns made the ability to 'get online' essential for citizens' full participation in society and highlighted the fact that there is more to imparting effective, lasting digital skills acquisition than supplying a set of instructions.

"[B]asic digital skills are not enough to create savvy citizens for the digital era," notes a July 2020 House of Lords report (Select Committee on Democracy and Digital Technologies, p. 109), which continues that, instead, enabling "the skills and competencies to participate creatively" should be of higher priority. "The COVID-19 pandemic has deepened [the digital divide] and exacerbated the resulting inequalities", says a July 2020 Cumberland Lodge *Digital Inclusion* report which goes on to say that, as we rebuild, "Creativity and innovation will be required alongside digitalisation" (Elahi, 2020, p. 62). Observing that COVID-19 has given creativity new centrality, the Durham Creativity Commission notes that:

> … digital technology is a means to an end. It is not inherently creative, but at the disposal of a creatively liberated mind, its potential becomes boundless. We need better and more creative digital literacy (Cohu, 2021, p. 4).

Creativity is important, then, for effective and lasting digital skills acquisition – but, what exactly is 'creativity' in this context, and, how can it be enabled with measurable effectiveness? These questions are the subject of this chapter, which makes three main contributions to the understanding of how digital skills are acquired and developed. Firstly, the research reported here provides evidence that creativity can be deployed to enable

sustainable and resilient, or 'future-proofing' digital skills acquisition. It demonstrates that an existing method of deploying creativity to enable 'future-proofing' digital skills acquisition that has been developed and extensively empirically tested in the field of Creative Writing (Barnard, 2019a, pp. 85–89) can be effective in a new context. That context, specifically, concerns select staff at small NGOs/charities who work with digitally excluded citizens. As MP Sharon Hodgson highlighted during a Westminster Hall debate, "Students who are taught creative writing are taught creative thinking" (quoting Barnard, HCDeb, 2014). Creativity is a transferrable skill (Barnard, 2019b, p. 206). The effectiveness of the existing method in this new context was tested via a small-scale longitudinal study during COVID-19 lockdowns (May 2020–May 2021) utilising in-depth interviews and participant-observation and participant evaluation sheets that enabled comparison with four previous studies and one subsequent study. These were conducted as part of a ten year programme of research into the role of creativity in digital upskilling (represented by publications and outputs including Barnard, 2016, 2017, 2019a, c). This first contribution leads to the second contribution. In a theory and policy context in which it is known in general terms that creativity is important but specificity regarding how is lacking, this chapter provides emergent findings to help improve the clarity, accuracy, and usefulness of our narrative on the nature and role of creativity in digital skills acquisition, embedding a practical understanding of how creativity functions in the context of digital skills acquisition and retention. This in turn leads to the third contribution, namely, a new theoretical position on the role of creativity in developing resilience in the digital sphere, with associated policy implications.

Far from being inherently creative, digital technologies can stifle creativity. This chapter demonstrates that the creative process offers a powerful tool for developing future-proofing digital skills by enabling people to develop methods based on their own experience and capabilities that can liberate the potential of digital technologies.

2   Digital Skills, Context

Before the Covid pandemic, levels of digital exclusion were already of serious concern. In 2019, 'an estimated 11.7 million (22%) people in the UK [were] without the skills needed for everyday life', according to one of the UK's main measures of digital inclusion, the Lloyds Bank Consumer

Digital Index (Lloyds, 2020). At this time, lifeline services such as the UK's Universal Credit were already 'digital by default' and "at least 82% of online advertised job openings in the UK requir[ed] a good level of digital competencies from applicants" (Djumalieva & Cooke, 2020). That is, in 2019, already, digital was not a choice. Yet what constitutes a 'good level of digital competencies' was then and remains in a state of flux.

Due to Covid lockdowns, digital engagement reached a level that had been projected for 2025 "indicat[ing] that the UK has made five years progress in just one year", noted one report in May 2021 (Lloyds, 2021, p. 46). However, much of that change was forced by a pandemic, and cannot be described as 'progress' for all. For example, a November 2021 report notes that 56% of educators surveyed said "teachers and learners do not have the skills needed to make digital learning a success" and 66% reported "devices being shared with multiple family members' as the most widespread challenge" (OUP, 2021, np). The speed with which many citizens were forced online exacerbated the digital divide and brought a key question to the fore: is that change sustainable? The same Lloyds May 2021 report notes that "21% of people with Very High engagement have stepped down to the High segment" (Lloyds, 2021, p. 13), emphasising, "digital capability is not a permanent state" (Lloyds, 2021, p. 10). The OUP report suggests that we should be talking not of digital 'upskilling' but, rather, digital 'always-skilling' (OUP, 2021, np). "If we are to have a digital economy and society that everyone can participate in, a culture of life-long learning and confidence building is key" (Lloyds, 2021, p. 46).

It is important to ask, then, how such life-long learning and confidence building are to take place and who is to provide them. A 'one-size-fits-all' approach does *not* work (Damodaran & Burrows, 2017), this has been demonstrated; a 'user-centred' approach *does* work (Damodaran & Olphert, 2015). Given citizens' diverse needs, identifying user-centred solutions that can be applied remotely and widely represents a significant challenge, a challenge that the research study presented here addresses, via an innovative approach.

A significant gap in digital skills research methods has been noted. "Since the 1990s, the role of digital technology in everyday life has changed dramatically, but the way we understand and study digital skills have not kept pace" (Allman & Blank, 2021, p. 2), yet, the 'human experience' of digital upskilling has been largely neglected (Allman & Blank, 2021, p. 11). The study presented here not only positions human experience of deploying creativity to enable digital upskilling centrally, it also benefits

from a decade-long programme of empirical research that does so (represented by publications and outputs including Barnard, 2016, 2017, 2019a, c). Further, the research here was conducted during the first Covid lockdown when fear was endemic. That is, the means of enabling creative flexibility used to support 'future-proofing' digital upskilling was tested during a period when fear had the potential to inhibit learning, and the means of enabling such creative flexibility was found to be effective. Before providing detail of the methodology utilised, this chapter considers 'creativity'.

3   CREATIVITY, CONTEXT

The report *Boundless Creativity* notes that it is important to gain understanding of creativity in the context of digital engagement as we build back after the Covid pandemic (DCMS and AHRC, 2021, p. 6). Yet, like 'digital', 'creativity' is a moving target.

Creativity is certainly viewed as valuable. Pre-pandemic, the creative industries contributed £115.9 billion per year and grew at more than five times the rate of the overall economy (DCMS and AHRC, 2021, pp. 4–5). The creative and cultural industries "constitute the most distinct area of economic growth of the new Millennium" (Granger, 2020, p. 3). Creativity can improve citizen's health and wellbeing and is, consequently, key to society's work rebuilding in response to Covid (DCMS and AHRC, 2021). However, "[m]uch of the definitional basis of creativity and the way society ascribes value to it—or valorises—draw on economic and productionist terms of reference" (Granger, 2020, p. 6). It can seem that providing a concise and absolute definition of 'creativity' is valuable in and of itself; neat definitions can give a sense of control. Yet, creativity is not a pill that can be swallowed.

The idea of 'creativity' tends to bring complex human responses. Koestler notes that the creative act "involves several levels of consciousness" (Koestler, 2014, p. 658). Hayles argues that we do not like to acknowledge the driving role of the sub- and/or unconscious in creative decision-making because to do so downplays 'human agency' (2012, p. 95). Meanwhile, every day, with our 'mashup minds' working at the "productive interface of brain, body, and social and material world", as Andy Clark frames it, "'messy' but powerful solutions are reliably found" (Clark, 2008, p. 219). The short story writer Flannery O'Connor famously said, "asking me to talk about story-writing is like asking a fish to lecture on swimming". If a creative practitioner is highly effective without

understanding how their creativity works, it may seem dangerous to attempt to know that creativity – perhaps dissecting it will destroy it.

However, it is possible for an individual to arrive at a position where their creativity remains unknowable in a complete sense whilst simultaneously enough is known about how to operationalise their creativity for it to be possible to knowingly establish the preconditions for that creativity (for discussion, see Barnard, 2019a, pp. 70–79). An individual's perception of their own creativity is important. Informed by prior research (Barnard, 2016, 2017, 2019a, b, c), during the study reported here, a key aim was to help participants feel that they could self-define, and so make it possible to intentionally activate and purposefully deploy, their creativity.

There is "an imperative for policy and academia to prioritise new ways of thinking about what value means" in the context of creativity (Granger, 2020, p. 6). This chapter embraces that challenge. It contends that adoption of a user-centred (as opposed to productionist) approach to creativity such as the one presented here can transform digital engagement now and in the future.

4   Methods

The small-scale longitudinal Covid lockdown study conducted May 2020–May 2021 provides the data that is the main focus of this chapter. As indicated, this study addressed the following research problems:

- Can a method of teaching creativity that enables digital upskilling with measurable effectiveness that was developed in Higher Education in Creative Writing be delivered remotely beyond the home discipline and outside Higher Education?
- Can this be done via a single assignment, the multimodal practice model of creativity (MPMC) (Barnard, 2019, pp. 85–89)?
- If this can be done, what adaptations of the assignment are needed to optimise effectiveness?
- Can delivery of the assignment be used as a case study to help improve the clarity, accuracy and usefulness of our narrative on the nature and role of creativity in digital skills acquisition and retention?

The methods used were drawn from the methodology utilised to develop the MPMC assignment (for detail of that methodology, see Barnard, 2019a, pp. 130–133). These methods, having been utilised for a

ten-year programme of research, were selected as optimally expeditious because they enabled comparative assessment of qualitative and quantitative data. For the May 2020–May 2021 Covid lockdown study, quantitative data has been included for context, but it is the qualitative data that is the main focus. The mixed methods approach used comprised:

- in-situ trials of the multimodal practice model of creativity (MPMC) as a pedagogical assignment;
- participant observation;
- participant evaluation sheets;
- in-depth interviews.

Participants of the Covid lockdown study comprised five members of staff at charities/NGOs that work with a range of digitally excluded citizens including NEET (Not in Education, Employment or Training) young people, older people, unemployed citizens and citizens with English as a second language. At the start of the May 2020 lockdown, participants had different levels of digital skills. Staff roles represented by the participants include client support, volunteer support, fundraising and events organisation. As noted, the first COVID lockdown began on 23rd March 2020. For the study, the five participants were provided with digital upskilling training, specifically, MPMC delivered as a pedagogical assignment to each participant individually during a dedicated MPMC session. Prior to each MPMC session, participants were sent the assignment in full (Barnard, 2019a, pp. 85–89), so they could read it in advance if they wanted to.

The assignment was completed via video calls of approximately one hour each with the participants between 5th and 14th May 2020. The interviews were digitally recorded and transcribed. A topic guide was used to ensure consistency of subject matter covered. All transcripts were sent to the participants in order to confirm that they accurately reflected their views and amendments were inserted where requested. As close to one week after each participant's completion of the assignment as possible, in-depth evaluation interviews of between 34 and 49 minutes were conducted, also via video call. Participants completed two evaluation sheets, the first evaluating participants' levels of digital literacy at the study's start point, the second evaluating the effectiveness of the MPMC assignment. Importantly, the second evaluation sheet was the same evaluation sheet used for four previous studies and one subsequent Covid lockdown study conducted as part of a ten year programme of research in order to (as

indicated) enable comparative assessment of the data. The four previous studies and one subsequent study (27 participants) – hereinafter called collectively 'the supporting studies' – were conducted within a UK Higher Education Institution (HEI) (supporting studies 1–4; face-to-face delivery) and an Estonian HEI (supporting study 5; remote delivery) with students at Undergraduate and Postgraduate levels represented; for supporting studies 1, 2 and 4, MPMC was delivered as an assignment as part of year-long courses in Creative Writing (Postgraduate), Publishing (Undergraduate, third year) and Journalism (Undergraduate, second year); supporting study 3 was one two hour class dedicated to MPMC within an existing postgraduate Arts Festival Management course; supporting study 5 was a new six week course, Theories of Creativity, delivered remotely to diverse PhD students at an Estonian university, with the MPMC assignment delivered in Week 1 and developed Weeks 2–6. For all participants, MPMC was an 'opt in' assignment. The studies are in addition to regular classroom delivery.

5   Observing and Supporting Development of Digital Resilience

5.1   *Practicalities*

Everyone has different experiences of and needs for digital technologies. Hence, development of creative flexibility and facilitating personalisation of approach are guiding principles of the method of helping develop 'future-proofing' digital upskilling considered here. The MPMC "is not intended to be a hard and fast set of rules. It is to be used and altered and developed over time" (Barnard, 2019a, p. 79); that is, the model (summarised below) is designed to be personalised by each user and adapted by that user as digital technologies and each user's corresponding needs develop and change. For the study's digital engagement sessions, participants were asked to keep a copy of the model in front of them either digitally or as a hard copy. Also – in the same way that it was explained in HEI classroom contexts for the four previous studies and one subsequent – the model was explained to each participant during the session, with space for questions.

The multimodal practice model of creativity (MPMC) can be summarised as comprising 'writerly resources' (including 'remediation of practice'), 'writerly personas', 'expert intuition', 'inner auteur' and 'creative

projects'. This model applies internal multimodality to external multi-modal problems.

Specialist Creative Writing terminology used in the original assignment was retained for the Covid lockdown study for two reasons, to enable: comparison with the supporting studies; to enable consideration of whether that terminology could helpfully be altered to make the assignment accessible more widely and, if so, how. Two terms in particular, 'remediation of practice' (a 'writerly resource') and 'inner auteur', proved tricky for participants to grasp initially. Yet, once the participants understood them, it was these two concepts that proved to be especially useful (for discussion, see below). It was emphasised that it was fine for the participants to use alternative terms ('remediation of practice' could be thought of as 'upcycling' or 'skills transfer', for example. That participants should identify terminology or phrases that made the concepts meaningful for them was the priority. Most terms transferred quite easily to participants' individual contexts. 'Writing' was interpreted as embracing production of content that was published online or submitted digitally to the workplace, for example, as tweets, WhatsApp messages, emails and/or work reports. 'Creative projects' were interpreted as online projects that were of particular importance to the participant (for example, a new Covid email newsletter, a presentation involving Powerpoint for a work team meeting via video call). 'Writerly personas' were interpreted as the different parts of oneself that come to the fore for different parts of the creative act (for example, a more experimental aspect of oneself for a first draft, a more pragmatic aspect of oneself for a final edit). 'Writerly resources' might include, for example, a cup of coffee (to help energise at the start of a first draft), a pen and paper (to compose a structure), a particular computer software (while editing) and/or a deadline (to motivate completion), as well as remediation of practice (see on). Participants were invited to select a current or upcoming online 'creative project' that had a technological element that was new to them and consequently felt daunting so that the selected project could be used as a case study to help build and test their personalised model of creativity. Then, the remaining portions of the MPMC sessions were devoted to supporting the participants in developing their own personalised models of creativity.

Each participant asked several times whether it was genuinely the case that they could alter the model, checking if there was a 'right' or 'wrong' way of doing the assignment; for each participant, an important moment – a moment when confidence visibly increased – was when they accepted

that they were free to alter the model to fit their experience and began to do so. Participants reflected on these increases of confidence, with Participant A noting the connection between enjoying the assignment and confidence increasing, for example. Participant B said they considered their digital skills to have gone from a score of 4 before the assignment up to an 8 after the assignment due to an increase in 'confidence and how I can approach different things'. Another moment when confidence visibly increased tended to come when participants identified a particular metaphor that encompassed several aspects of their evolving model of creativity and had strong associations with past success in endeavours that were new to them (of which, more later).

At the end of the delivery via video call of the MPMC assignment, participants were asked to complete an evaluation sheet that uses QAA Creative Writing benchmarks (2016) and provides space for comment (Fig. 9.1).

6   Discussion

As noted, this small scale longitudinal Covid lockdown study had, among its aims, helping to improve participants' digital skills and helping to improve creativity. Quantitative data indicates that both these aims were achieved. As Fig. 9.2 shows, all participants judged that, shortly after completion of the MPMC assignment, their digital skills had improved. For four participants, the increase was between 0.5 and 1.5; for one participant the increase in digital skills was (as noted) double, from 4 to 8. Importantly, all participants confirmed one year after completing the MPMC assignment that their personalised MPMC was still useful to them in the context of ongoing digital upskilling. As Fig. 9.3 shows, all participants found that the MPMC assignment helped develop their 'capacity to be creative', as was the case for participants in all supporting studies 2018–2021 (see Fig. 9.4). The Covid lockdown study participants completed their evaluation sheets shortly after the May 2020 assignment; follow-up communications May 2021 confirmed that the MPMC continued to aid participants' self-defined 'capacity to be creative'. Clearly, these are positive findings in the context of this study. However, these were not the only aims of this research.

A driving aim of the Covid lockdown study was to help improve the clarity, accuracy and usefulness of our narrative on the nature and role of creativity in digital skills acquisition. Key findings in this regard centre on

Project: Digital Upskilling

Topic title: Assignment evaluation sheet

This feedback sheet is designed to help you reflect on how the set tasks have supported digital upskilling via *development of creative flexibility. It uses QAA Creative Writing benchmarks as an indicator. Please consider whether the tasks have helped you develop the Creative Writing benchmarks in the left hand column, answering 'Yes' (it helped), 'No' (it didn't help), or 'Don't know' and adding a short comment on how/why.*

CREATIVE WRITING BENCHMARKS[1]:	*Has the set task helped you develop the corresponding creative writing benchmark?* **Please answer 'yes', 'no' or 'don't know' and comment**
INTELLECTUAL ENQUIRY (eg constructive criticism, research through reading, editing/proof-reading) 5.2.ii, 5.2.viii	Yes/No/Don't know Comment:
ROBUST ARTISTIC PRACTICES (eg workshopping, point of view, characterization) 5.2.iii, 5.2.xi	Yes/No/Don't know Comment:
CAPACITY TO BE CREATIVE (eg generate ideas, first drafts, imagery, theme) 5.2.i, 5.2.vi	Yes/No/Don't know Comment:
PRACTICAL APPLICATION OF AESTHETIC SENSIBILITY (eg social media, writing for audience) 5.2.ix, 5.2.x	Yes/No/Don't know Comment:
CONDUCT RESEARCH AND COMPLETE MATERIAL (eg creative and market research, genre, structure) 5.2.iv, 5.2.v	Yes/No/Don't know Comment:
SELF-REFLECTION AND INDEPENDENT LEARNING (eg acting on constructive criticism, re-drafting) 5.2.vii, 5.2.xii	Yes/No/Don't know Comment:

Any other comments:	

Fig. 9.1   Participants' development of Creative Writing skills, self-assessment

Participant	Digital skills before COVID	Digital skills at start of first COVID lockdown	Digital skills after completing assignment
A	6	6	7.5
B	7	4	8
C	8	8	9
D	8	7	8
E	7	7.5	8

Fig. 9.2 Participants' digital skills, self-assessment

participants' personalisation of terminology in order to delineate and articulate their creative process. As noted, two terms in particular proved both in need of additional explanation and particularly helpful to participants, specifically: 'remediation of practice' and 'inner auteur'. During the MPMC sessions, it was explained that 'writerly resources' can and should include the participant's own prior experience of tackling something that was new to them – that is, of 'remediating' their own practice:

> To negotiate the demands that come (thick and fast) in a twenty-first century characterised by a high turnover of new media technologies, a writer can "remediate" his or her own practice: that is, instead of rejecting experiences of "old" media as redundant, writers can productively mobilise prior creative experiences and transfer skills gained previously into new digital multimedia and networked environments. As new challenges and opportunities arise, a writer who remediates his or her own practice "looks to existing skills and prior experience and adapts or applies them in new contexts as part of a process of, in effect, collaborating with him or herself". (Barnard, 2019a, p. 29).

The 'inner auteur' that features at the centre of the model represents the role played by the unconscious in providing '"messy" but powerful solutions':

> A flash of lightning cannot operate in a vacuum. It needs the right conditions before it can hit a tree and – apparently miraculously – split it. Similarly, a solution that may appear to arrive out of the blue has had the conditions for its arrival set up already. The "inner auteur" is able to identify that a flash of expert intuition has arrived, conditions are right and it should be acted

Fig. 9.3 Participants' capacity to be creative, self-assessment – Covid lockdown study only

CREATIVE WRITING BENCHMARKS:	*Has the set task helped you develop the corresponding creative writing benchmark?*
	Project: CLDU Date: May 2020 Participant no.: 5
INTELLECTUAL ENQUIRY	Yes: 5 No: 0 Don't know: 0
ROBUST ARTISTIC PRACTICES	Yes: 5 No: 0 Don't know: 0
CAPACITY TO BE CREATIVE	Yes: 5 No: 0 Don't know: 0
PRACTICAL APPLICATION OF AESTHETIC SENSIBILITY	Yes: 4 No: 0 Don't know: 1
CONDUCT RESEARCH AND COMPLETE MATERIAL	Yes: 5 No: 0 Don't know: 0
SELF-REFLECTION AND INDEPENDENT LEARNING	Yes: 5 No: 0 Don't know: 0

	Has the set task helped you develop the corresponding creative writing benchmark?					
CREATIVE WRITING BENCHMARKS:	Supporting study (S)1 Class: CMW4100 Date: 25-10-2018* Participants: 5	S2 Class: PUB3300 Date: 6-2-2019* Participants: 6	S3 Class: ACI4100 Date: 14-3-2019 Participants: 3	S4 Class: JCM2302 Date: 21-3-2019* Participants: 6	Research study: CDU Class: NA May 2020 Participants: 5	S5 Class: ToC March-May 2021 Participants: 7
INTELLECTUAL ENQUIRY	Yes: 4 No: 0 Don't know: 1	Yes: 4 No: 2 Don't know: 0	Yes: 3 No: 0 Don't know: 0	Yes: 6 No: 0 Don't know: 0	Yes: 5 No: 0 Don't know: 0	Yes: 4 No: 1 Don't know: 2
ROBUST ARTISTIC PRACTICES	Yes: 5 No: 0 Don't know: 0	Yes: 5 No: 0 Don't know: 1	Yes: 2 No: 0 Don't know: 1	Yes: 5 No: 0 Don't know: 1	Yes: 5 No: 0 Don't know: 0	Yes: 5 No: 1 Don't know: 1
CAPACITY TO BE CREATIVE	Yes: 5 No: 0 Don't know: 0	Yes: 6 No: 0 Don't know: 0	Yes: 3 No: 0 Don't know: 0	Yes: 6 No: 0 Don't know: 0	Yes: 5 No: 0 Don't know: 0	Yes: 7 No: 0 Don't know: 0
PRACTICAL APPLICATION OF AESTHETIC SENSIBILITY	Yes: 0 No: 0 Don't know: 5	Yes: 5 No: 0 Don't know: 1	Yes: 2 No: 0 Don't know: 1	Yes: 4 No: 0 Don't know: 2	Yes: 4 No: 0 Don't know: 1	Yes: 5 No: 0 Don't know: 2
CONDUCT RESEARCH AND COMPLETE MATERIAL	Yes: 2 No: 0 Don't know: 3	Yes: 5 No: 0 Don't know: 1	Yes: 2 No: 0 Don't know: 1	Yes: 5 No: 0 Don't know: 1	Yes: 5 No: 0 Don't know: 0	Yes: 4 No: 0 Don't know: 3
SELF-REFLECTION AND INDEPENDENT LEARNING	Yes: 5 No: 0 Don't know: 0	Yes: 5 No: 1 Don't know: 0	Yes: 2 No: 0 Don't know: 1	Yes: 6 No: 0 Don't know: 0	Yes: 5 No: 0 Don't know: 0	Yes: 6 No: 0 Don't know: 1

* Indicates date during year-long course on which MPMC assignment delivered.

Fig. 9.4   Participants' capacity to be creative, self-assessment – Covid lockdown study and supporting studies

on. It is not merely an additional writerly persona. A writer may be aware of different writerly personas and step into them consciously. Rather, the inner auteur (a kind of internal auterist film director or ghostly diagnosing GP or puppetmaster) represents our co-ordinating unconscious capacity. (Barnard, 2019a, p. 81).

A simple reminder that even a pencil was once new technology was helpful in explaining 'remediation of practice'. It freed participants to think back to first times of using or doing something else that was new to them that could seem separate from digital technology – such as riding a bike, or

learning ballet – and consider how they tackled the nerves then, to see if any strategies could be 'remediated' in a new, digital context. That is, in wrestling with the terms, the participants were already starting to wrestle with how to locate and assess their creativity. None of the Covid lockdown study participants had previous experience of formal study of Creative Writing. Yet, the consensus was that, even though it took work to understand some of the terminology, that work was helpful. The fact that the terminology came from a field that felt remote helped bring a fresh perspective that helped them recognise that they had an identifiable creative process to work with (this in itself was new information for most participants, with one surprised to be 'creating creativity' and another saying, 'There it is, my creative process – and I didn't even know I had one!').

Participant A's increased confidence during the MPMC assignment tied closely to the moment at which art school training that could be remediated was recalled; 'excitement' recurred as a synonym for creativity on Participant A's personalised MPMC, which was a highly colourful mind map with, at the centre, a drawing of a dragonfly as the 'Lure' of 'excitement'. The metaphor of fishing equipment was extended visually across the page. The drawing of the 'Lure' ended in a fishing 'hook' that attached to 'external resources' including, for example, 'contracted expectations' and 'sticky notes, different colours and shapes', to indicate that they helped facilitate Participant A's creativity. For Participant B, accepting that a 'babble self' played a valuable part proved pivotal. On the MPMC assignment evaluation sheet, against 'CAPACITY TO BE CREATIVE', Participant B noted that the 'thinking changed to "having a go" "what have you got to lose"'; against 'ROBUST ARTISTIC PRACTICES', Participant B's comment was "Really useful, it was good to think about naming my writerly personas, and how it's ok to have what I have called my babble self, followed by Focused self, etc". As preferred terms grew clearer, so too did participants' confidence in their grasp of key elements of their creativity as it relates to and supports improved digital engagement.

Digital technologies can seem to cast spells and have magical qualities, they can undermine users' feelings of agency (Barnard, 2017, p. 277). It is known that empowerment is a key enabler of digital skills acquisition (see for example DCMS, 2020; Select Committee on Democracy and Digital Technologies, 2020). A sense of empowerment may be attached to an external supporting individual or institution (the 'IT person' at work, or a charitable organisation offering digital upskilling sessions, for example). If feelings of empowerment are internalised, they are more likely to

be resilient and lasting. Finding the right metaphor proved to be a key enabler in this regard.

Participant C was cautious about the MPMC assignment terminology, with particular wariness of the idea of different writerly personas, until they identified the persona of 'Adventurer', when the process of personalising the model of creativity sped up exponentially. The term 'Inner auteur' was replaced with 'COMPASS' (in capital letters); discussion during the assignment made clear that the fact that a compass continues to move and 'quiver' even when it has found the right direction was especially important (a compass remains dynamic). Once Participant C identified the compass-wielding 'Adventurer', other personas quickly emerged – including, for example, as a further extension of the adventurer/compass metaphor, 'Pirate – rule breaker' – until the final model featured 12 external personas and nine internal personas.

For Participant D, the process of personalising the model of creativity gained momentum when Lego was identified as a core metaphor. Remediation of childhood play with Lego enabled the identification of related personas ('Collector', 'Architect' and 'Engineer'), and it helped in the physical construction of a coherent picture of Participant D's creative process. The layout of Participant D's personalised model on the page was strikingly architectural. The two creative projects became pillars flanking blocks representing 'Expert intuition' and 'Facilitator' (Participant D's version of 'Inner auteur'), blocks that were in turn supported by four pillars: 'Personas', 'Modes', 'Inner-resources' and 'External resources'.

The core metaphors of 'COMPASS' and 'Lego' had the power for Participants C and D respectively to conjure the entire creative process and help make it feel manageable. For Participant E, an equivalent function was served by the metaphor of a 'combine harvester', whereby apparently disparate elements – external and internal resources; writerly personas – are drawn together productively. Thus, the metaphor of a 'combine harvester' provided for Participant E an image that can be conjured instantaneously whereby diverse elements of a new digital challenge are faced and addressed and a method of finding a solution provided, all via one compact phrase: 'the combine harvester approach'. A year after first completing the MPMC assignment, Participant E was still using the model to help, both in practical ways (to produce and disseminate a monthly email newsletter, for example) and for 'more creative things' (such as community Zoom meetings organised to provide support through a time of crisis):

> I've continued to use the Model of Creativity when I've put things together, I've found it to be really helpful. It's that combine harvester approach, throw it all in, work out what's important and how you present it using Zoom, using screen share and the chat box. The assignment we did has helped me do a better job, and quicker and less stressful and more enjoyable.

For Participant D a year later:

> Lego has definitely recurred. How do you break down the elements of an offline event and reassemble them as an online event? It's about identifying the component parts and critically assessing those component parts. … Tech can be limiting. It's the architect persona I use because it's about redesigning a space for the flow and emotional response that's wanted rather than getting stuck with the idea of where a door and window *should* go and being limited by that.

Importantly, while the image of Lego, a compass and/or a combine harvester could potentially be useful for other people as well, there is no guarantee that those particular metaphors will work for others. It is of note that for each participant of the Covid lockdown study, the core metaphor was different – and, that is true across all studies (Fig. 9.4). This is not surprising, as each metaphor, inevitably, emerged from different past experiences and was applied in different ways in different contexts to a wide range of current digital problems. Giving the time needed by each participant to find the metaphor that was meaningful for them was an essential part of the process.

Just as each participant provided their own core metaphors to help articulate and delineate their creativity, they provided their own definition of digital literacy prior to the MPMC session and their own assessment of resulting changes to their digital skills levels.

The digital literacy feedback sheets indicated that most participants engaged with a range of social media platforms, said they 'like' social media and used it 'daily', with the exception of Participant E, who said they 'dislike' social media and used it 'weekly'. Taking Fig. 9.2 and the digital literacy evaluation sheets together, it is of note that on Fig. 9.2, participants all positioned themselves at between 6 and 8 in terms of their digital skills level before Covid lockdown despite personal definitions of digital literacy that suggested wider disparities. For example, Participant B rated their digital skills as 7 before Covid and gave this definition of

'digital literacy': 'Being able to use tablets, phones, laptops, desktops confidently. Understanding the different platforms and how to use them, how they interact and different methods of communicating with people'. By contrast, Participant D, who scored themselves just one point above participant B before Covid (at 8), gave this personal definition of 'digital literacy': 'being able to achieve what you need/want to do using appropriate digital tools and services. Having an understanding of how the services work and are funded and what data and information you are providing and how that may be used. Being able to critically assess digital tools, services and devices and choose the most appropriate for the task you want to accomplish. Being confident to try and use new tools and services by applying learning from other contexts. I think there are multiple digital literacies that work in combination with access and citizenship to provide an overall digital capability.' Thus, Participant B's personal definition of digital literacy was much more practical (foregrounding a basic understanding of how to use devices/platforms plus the ability to do so with confidence), whereas Participant D's personal definition of digital literacy embraces issues ranging from trust (who funds services used) to privacy (companies' use of data) and clarifies that there are multiple digital literacies, distinguishing between basic access and issues of citizenship. It is a contention of this chapter that imposing a judgement of participants' levels of digital skills would have been disempowering; self-assessment kept participants' focus on gaining digital skills in manageable increments.

7   CONCLUDING COMMENTS

To briefly re-cap, then: the research reported here provides evidence that creativity can be deployed to enable sustainable and resilient, or 'future-proofing' digital skills acquisition. It demonstrates that an empirically tested method of teaching creativity that enables digital upskilling with measurable effectiveness via a single assignment (Barnard, 2019a, pp. 85–89) could be delivered remotely to select staff at small NGOs/charities who work with digitally excluded citizens. Participants' self-defined capacity to be creative and digital skills were shown to have improved following the assignment, with lasting benefits. Thus, this chapter has shown that a model of creativity assignment that was developed for face-to-face delivery in Higher Education in the home discipline of Creative Writing can be used outside the home discipline and beyond Higher Education. It can also be delivered effectively with citizens in

remote mode, and help them negotiate the challenge of developing a creative flexibility that supports and enables 'future-proofing' (i.e. sustainable and resilient) digital skills acquisition.

However, these were not the only or key aims of this research. A driving aim of the Covid lockdown study was to help improve the clarity, accuracy and usefulness of our narrative on the nature and role of creativity in digital skills acquisition, embedding a practical understanding of how creativity functions in the context of digital skills acquisition and retention. Importantly, metaphors – specifically, metaphors selected by users – can play a highly valuable role. Ideas of 'digital resilience' have centred on enabling citizens to avoid and/or mitigate 'risk' and 'harm' (UKCIS, 2019). Safety online is important, of course. However, words such as 'risk' and 'harm' are likely to be accompanied by fear, which tends to limit experimentation and playfulness. All participants of the Covid lockdown study included experimentation (or, playfulness) as a valuable part of their creative process.

Many methods of digital upskilling tend to make participants feel inadequate, highlighting what they can *not* do. The approach presented here gives participants agency. Giving people confidence in what *they* bring makes a profound difference.

An important implication for policy is that, in the context of supporting 'roll out' of digital skills acquisition, the user orientation to creativity should be given centrality. When the participants could take control of the discourse or insight into the task, they experienced transformation.

Opportunities for digital skills acquisition should be accompanied by a proper consideration of the optimum time for acquisition (to allow identification by individual users of the language that is most empowering for them). There are numerous online digital courses which users can do solo. However, human interactions can help ensure that moments when confidence in developing a personalised method of digital upskilling increase – and the words that accompany or trigger those moments – are noticed and built on. Existing terminology that has been shown to help citizens negotiate technological challenges can be provided as a starting point (as well as examples above, see as sample practitioners' accounts of productive application of Barnard's model of creativity and 'remediation of practice' Holdstock (2021) and Rangel (2022) respectively). To be accurate and useful, facilitators' language should include invitation to participants to provide their own customised terminology and core metaphors. Rather

than imposed judgements, self-assessment of levels of digital skills should be embedded.

In conclusion, then, this research has met its objectives. It has:

- outlined a single, adaptable model of creativity that has been shown to support 'future-proofing' (i.e. sustainable and resilient) digital skills acquisition for use with diverse citizen, face-to-face or remotely;
- provided quantitative and qualitative assessment of the effectiveness of that model in supporting 'future-proofing' digital skills acquisition;
- contributed discussion drawn from empirical data to help improve the clarity, accuracy and usefulness of our narrative on the nature and role of creativity in digital skills acquisition, providing new insights into the role of metaphor and customisation of terminology in deploying creativity that can enable 'future-proofing' digital skills acquisition;
- presented a new theoretical position on the role of creativity in developing resilience in the digital sphere that is supported by a ten year programme of research (represented by Barnard, 2019a), whereby the multi-dimensional nature of online interactions and the ongoing digital upskilling that is necessitated for citizens by fast-paced technological change can be accommodated.

This chapter shows that an individual's creativity can be both *un*knowable and *knowable enough* for citizens to be able to deploy it effectively in the service of 'future-proofing' digital skills acquisition.

One currently under-researched area is how to enable ongoing uplift of digitally competent workers' digital skills to prevent their digital skills diminishing over time for reasons including work cultures whereby employees are expected to learn 'on the job' (see for example, Learning and Work Institute, 2021, p. 8). The study reported here makes a contribution in that area. However, these emergent findings illustrate that there is still a great deal more to do in exploring and developing our narrative on the nature and role of creativity in digital skills acquisition.

The report *Boundless Creativity* notes the need to 'demonstrate the value of creativity beyond the economic' (2021, p. 18). If, via approaches such as the one presented here, citizens can feel confident, even before they have arrived at new technological challenges, that they will be able to deploy creativity to help them address new challenges on the basis of experience of success, then creativity becomes an invaluable, constant resource.

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Through Media and Digital Literacy Education Towards Civic Participation of Disadvantaged Youth

Lucie Römer

1 Media Literacy Education of 'Those, Who Should Stay Quiet'

It is not the issue that they would not want to talk. They are afraid to talk. Because vocational schools are attended by the kids, who were to be quiet at elementary schools. The teachers kept telling them to be quiet, because they needed to discuss something with those who were to continue their studies at the more elite grammar schools. So, they are quiet at elementary school, to get by. And then they are also quiet at vocational school, to get somehow by. (Vocational schoolteacher, Czechia)

The youth have been spending more time with the media than sleeping (Couldry, 2016; Performics, 2016). The time spent on-line has doubled in this segment of the society over the past ten years (Šmahel et al., 2020). Media offer unexpected citizen participation (CP) options to the youth,

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who are not yet allowed to legally drive a car, go for a drink, or vote for the president. With the help of technologies, whom they often master better than more mature citizens, youth have helped push President Obama to revise the migration policy (Jenkins et al., 2019), call together demonstrations attended by millions of people in 150 countries (FridaysForFuture) or boost the longitudinal resistance of the inhabitants of Hong Kong against China (Zhong, 2019). In the form of media, (not only) the youth have access to citizen-participation tools undreamed of by the previous generations.

However, media competences are not distributed evenly (Hargittai, 2003; Gapski et al., 2017). In line with international research (e.g., Gapski et al., 2017), Czech media literacy research shows that media skills are unevenly distributed among different groups of students. Vocational school students and graduates are much less media literate than their grammar school peers. (Člověk v tísni, 2018, p. 13). Similar trend can be observed regarding their citizen participation (Linek, 2013).

We are facing what Jenkins (2009) calls the 'participation gap', which relates to the access to media, but also media literacy. Using media does not yet mean searching for something else than entertainment. Not all youth are media literate enough to be able to fully use their citizen possibilities. As "school-based media literacy activities provide a means of responding to these gaps in digital media literacy among youth" (Kahne et al., 2012, p. 4), media literacy education is often discussed as one of the ways to increase youth's civic participation (Kotilainen, 2009) and political engagement (Kahne et al., 2016). This was first mentioned in the Grunwald Declaration in 1982 (UNAOC, 2008).

Traditional political participation such as voting or taking part in a political campaign (van Deth, 2001) has been declining among youth over the past two decades (see, e. g. OECD, 2019; Livingstone et al., 2007; Linek, 2015). Although the young voters often receive labels such as "insufficient" (Bečevič & Dahlstedt, 2021) or "sceptical regarding their impact on politics" (Rada mládeže Slovenska, 2017, p. 83), studies have shown that youth are creative in searching their own ways to be heard (see, e. g. Bennett et al., 2009; Jenkins et al., 2019; Vinken, 2007, p. 48). According to Cho et al. (2020), "young people are less invested in 'dutiful' citizenship acts, favouring personalised engagement through digital networking, self-expression, protests, and volunteerism" (p. 3).

Though many are optimistic about MLE improving also civic participation skills (see, e. g., Mihailidis & Thevenin, 2013; Jenkins et al., 2019;

Hobbs, 1998), some academic work warns that MLE work may not be going deep enough (McDougall et al., 2014; Supa & Neag, 2020) or that there is not enough space for such interventions in the already restrained time for MLE (Römer, 2020). In spite of the growing number of relevant studies, work in the field of MLE linked to CP has several further gaps. For instance, very few studies in the field come from Central and Eastern Europe, and relatively little data focuses on the disadvantaged youth. Finally, MLE studies from Czech vocational schools are almost non-existent.

The following sections present the background, the methodology, the key findings and concludes by setting the study into the broader context.

2   Strongly Researched Area. Or Not?

2.1   Disadvantaged Media Users

The number of definitions of media literacy education has been expanding since the seminal definition of Aufderheide, who understood it as "the ability to access, analyse, evaluate, and produce media in a variety of forms" (1993). More and more precise and specific labels have been being invented, calling for digital literacy, film literacy, visual literacy, information literacy, media, and information literacy etc. (Frau-Meigs, 2012). However, this research joins the rather opposite trend, attempting to reunite the fragmentated field, whether it is under the umbrella of "transliteracy" (Frau-Meigs, 2012, p. 20), or simply "literacy" (Potter, 2012). The chapter will follow the Czech context, in which the term 'media literacy' education is dominant, and it will be understood in the broad sense as Aufderheide put it.

Even though media literacy education (MLE) had a strong position in the Czech Republic in the pre-WWI. era, the forty years of communism brought it to a halt and its resurrection after 1989 was challenging. MLE is now a compulsory part of the curricula for elementary schools and for the more elite high schools called grammar schools. As for the vocational schools (the high schools stressing more technical or manual study programmes), it is not explicitly obligatory (MŠMT, 2009). Although vocational schools 'produce' 70% graduates in the country, MLE is almost non-existent at these institutions. In contradiction to the international trends (see, e.g., Kotilainen & Pienimäki, 2019), also the Czech MLE research regarding these students is scarce. According to the People in

Need (Člověk v tísni) NGO, at 63% of vocational schools, MLE takes only 10 or less hours during the entire high school studies (2017). It almost does not exist there as separate subject, but it is exclusively taught as part of other classes or, very often, it is practiced in the form of one-shot workshops or debates (ČŠI, 2018, pp. 37–38). Numerous studies indicate that vocational school graduates are significantly less media literate than their peers at grammar schools (ČŠI, 2018; Člověk v tísni, 2018).

Although they are no homogenous group and although there are huge differences between these schools, there are many reasons to generally call Czech vocational school students/their graduates 'disadvantaged'. According to the Czech statistical office (ČSÚ), their average income is 20% below the country's average (2018). They deal more frequently with low self-esteem, resulting from challenging conditions related to family, school, or challenging socio-economic conditions (Römer, 2020). More often than their peers in the grammar schools, they deal with issues like teen pregnancy, drug use, and the imprisonment or alcoholism of family members (Römer, 2020). And, finally, they are disadvantaged due to the abovementioned lack of MLE at these schools, as a growing number of academics have noted that media literacy is one of the key prerequisites for full participation in society (see, e.g., Mihailidis & Thevenin, 2013; Frau-Meigs et al., 2017).

2.2   *Disadvantaged Citizens*

Turnout among young voters has been decreasing for the past two decades (OECD, 2019; Banaji & Buckingham, 2013). According to an OECD countries study, the participation of 18- to 24-year-old voters in elections is on average 17 percent lower than it is for adults aged twenty-five to fifty (OECD, 2019).

Citizens in general, but youth especially, are spending more and more time online and they have access to media connecting them with each other and, potentially, with a mass audience. As discovered by the *EU Kids Online I* report, which is based on research conducted with children aged nine to sixteen from nineteen European countries, European children and youth spend twice as much time online now as they did ten years ago (Smahel et al., 2020). And more and more of them are using this time and space to join in public debate (Jenkins et al., 2019). As Swedish research of Bruhn (1999) showed, the young did feel the need to engage and be a

part of a community (Bruhn in Milner, 2002). The youngest citizens are moving from conventional political participation (Letki, 2003) towards the non-conventional citizen participation, which includes not only voting of participating in political campaigns, but also for instance joining citizen protests, civic movements, or volunteering (León Rosales & Ålund, 2017).

However, not all youth have full access to digital technologies or internet and not all young have fully developed the digital participation competencies. We are facing what Jenkins et al. (2009) call the 'participation gap'. But MLE can 'provide a means of responding to the gaps in digital media literacy among youth' (Kahne et al., 2012, p. 4). Numerous studies have shown that MLE can improve also civic participation abilities of disadvantaged youth (Kahne et al., 2012; Kotilainen, 2009). An increasing number of academics draw on the citizenship model of MLE defined by Hobbs (2010). The model understands MLE as a way to enhance the "life skills that are necessary for full participation … in society" (Hobbs, 2010), including the power to make more responsible choices by comprehending information and ideas, creating content in a variety of forms, reflecting responsibly on one's own activities and communication behaviour, and working individually and with others to share knowledge and solve problems (Hobbs, 2010, vii–viii).

This study therefore addresses some of the research gaps identified above. It is the first in the Czech Republic to explore a conscious application of the citizenship MLE model on disadvantaged youth. The area is deeply under-researched, and it belongs to the less researched fields also in the international context (Kotilainen & Pienimäki, 2019).

3   Methodology

The study was designed as participatory action research (PAR). PAR has been successfully used in research aimed at improving MLE practices (see, e.g., Kotilainen, 2009 or Ranieri & Fabbro, 2016) and when working with disadvantaged groups in the past (Kotilainen & Pienimäki, 2019).

The highly cited five-stage methodology introduced by Susman (1983) was applied. This methodology consists of diagnosing, planning action, taking action, evaluating, and specifying lessons learned. Strict internal and external ethical guidelines (see, e.g., Graham et al., 2013) applicable to conducting research with youth were applied. Written GDPR informed consents were collected from parents and students. These included approval for the use of the students' photographs in the presentation of

the project. Further, the study was approved by the Research Ethics Committee of the Faculty of Social Sciences at Charles University (case number 4/2021).

The core of the study consists of two cycles of the PAR, applied from the year 2018 to 2021 at the vocational school in Louny (*Střední odborná škola generála Františka Fajtla v Lounech*). The first cycle took place from January 2018 to June 2020. The diagnosis stage of the research included a literature review, focusing on MLE, MLE with disadvantaged youth, civic participation, and their intersections. It also included a preliminary study, in which nine MLE vocational school Czech teachers were interviewed in 2018. The interviews explored the limitations and challenges they experience in their classes.

Based on the literature and on the preliminary study, a group of twenty characteristics of MLE teaching methods was identified, to be tested in the empirical part of the research. These characteristics are presented in Table 10.1.

Then, in the planning action phase, a vocational school in the Czech town of Louny was contacted and the pedagogical team consisting of two internal teachers and the researcher, and her supervisor designed a three-month long intervention, which was delivered within a practical training unit of the school's curriculum of the students in the 'interior decorator' programme. There were 17 student participants (SP); 16 girls and one boy aged 17 to 19. The design of the participatory action research focused on Hobbs (2010) citizenship model of media and information literacy (MIL). It built on students' previous experiences and knowledge (Buckingham, 2019).

For the 'action stage', the intervention was planned as a part of the 'Sametové posvícení' (Velvet Carnival) in Prague. The name of this satirical parade is inspired by the 1989 Velvet Revolution, which ended communism in Czechoslovakia. The parade uses non-violent, satirical tools to constructively critique current political and social issues and it has been celebrated every 17 November in Prague since 2012. The fusion with the parade was chosen especially to intensity the impact of the public action of the students, as the parade typically gets a lot of media coverage and tens of thousands of people watch the parade live. Despite its public attention, the parade seems to be especially important to its participants, rather than to the audience (Rybníčková et al., 2015), as the process of preparing for the parade has highly transformative potential. In this three-month-long

Table 10.1 Recommended characteristics of MLE teaching methods when working with disadvantaged youth

Characteristic	Source
Playfulness	Qing (2014), Livingstone (2007) and Kotilainen (2009)
Relevance for life and job	Baumann (2018)
Using social media	Median (2015), Jenkins et al. (2019) and Caliendo et al. (2016)
Interactivity and participation	Livingstone (2007)
Clarity of the topic	MLE teacher interview
Current	MLE teacher interview
Authentic interest of the teacher in the topic/method	MLE teacher interview
Adequately long activities (films max. 20 minutes, text max. Half an A4 page, frontal teaching max. 10 minutes long)	MLE teacher interview
Creative production	Kotilainen (2009), Hobbs (2013), MLE teacher interview, Qing (2014) and Zacher Pandya (2018)
Blending in- and out-of-school life	Ranieri and Fabbro (2016) and Carlsson et al. (2008)
Group work	MLE teacher interview and Zacher Pandya (2018)
Allowing the experience of success	MLE teacher interview and Zacher Pandya (2018)
Using also free time of students	MLE teacher interviews
Connecting students with the broader community	Zacher Pandya (2018), Hobbs (2013), Malka (2016), Milner (2002) and Dunsmore and Lagos (2008)
Breaching school routine	MLE teacher interview and Dunsmore and Lagos (2008)
On-line and off-line connected	Kahne et al. (2012), Gordon and Schirra (2013), de Abreu and Mihailidis (2013), Castells (2012) and Zacher Pandya (2018)
Stressing emotions	Hobbs (2013)
Non-hierarchical approach of teacher	Dahlgren (2007)
Using digital technologies	Brites and Castro (2021)

period, intense individual and group reflection on current political and societal issues occur. Usually groups consisting of NGOs, schools, or friends typically participate in the parade. The research participants from Louny were the first vocational school students ever to participate in the parade and the first non-Prague group.

In 'action' stage, thirty-five lessons were delivered, each forty-five minutes long, between September and November 2019. The author took a non-hierarchical, interactive, and participatory approach to all the classes. For example, the students were allowed to choose the political or societal problem to be addressed (they chose animal rights) or they could decide about the method how to choose the topic. To learn to address different audiences, the students spoke with local media and organised a press conference. They also created and administrated a profile of the project on social media of their choice (Facebook and Instagram). Next, they produced laminated masks, costumes, and a trolley for the parade. On 17 November 2019, they took part in the Velvet Carnival – they handed out pamphlets and performed a short theatre play.

The evaluating part consisted of the analysis of the multimodal data collected. This included: field observation notes in two research diaries kept by the project's principal investigator and the student's teacher (7000 and 3500 words, respectively) and pre-course and after-course surveys filled out by the students. These consisted of answering twenty questions using a ten-point Likert scale, which enabled them to evaluate their experience and their attitudes towards the media and civic participation. Seventeen surveys were collected, and they were followed-up by semi-structured interviews with four students (30–45 minutes long) and with the teacher (90 minutes long). After the transcription and anonymisation, they were openly coded using NVivo software and analysed thematically. Reflection and identification of findings was the core of the final, PAR phase in its first cycle (Fig. 10.1).

4   THE SECOND PAR CYCLE

The Second PAR cycle took part between June 2020 and October 2021. In the diagnostic phase, the findings from the first cycle were consulted with the supervisor, with the internal teacher in Louny, and with the students, and with further literature.

For the second PAR phase, another intervention was originally planned. But due to thecovid-19 pandemic, access of external people to schools was very limited and all contacted schools refused participation in the project. However, as PAR is based on two cycles at minimum (Bradbury, 2015, p. 5), another solution was found. Two focus groups (Morgan, 1996) with MLE teachers at vocational schools were designed instead.
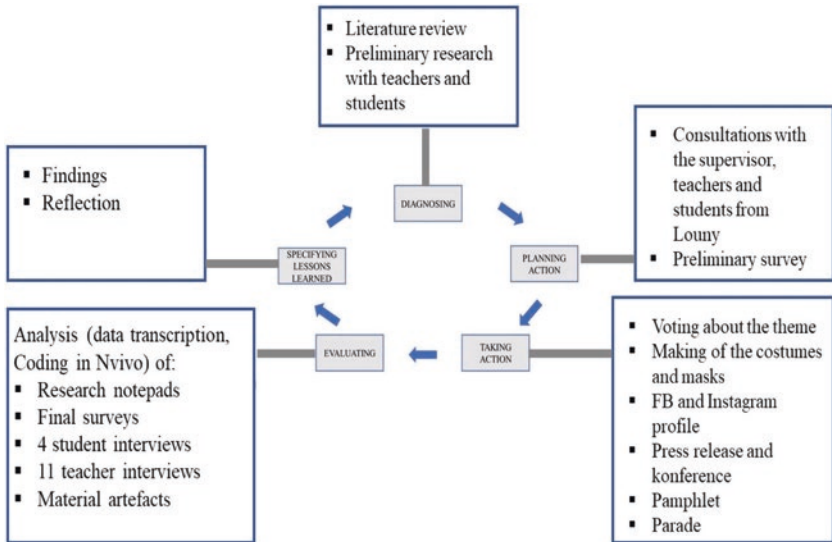
Fig. 10.1 Summary of the first PAR cycle according to the 5-phase-PAR of G. Susman (1983)

Two focus groups were organised on the Google Meet platform in June 2021. Each of them was 90 minutes long and in total 9 teachers participated. The debate was recorded with the permission of the participants. Most teachers did not know each other before, but they interacted intensively. As the author was keeping contact with the students via the Facebook group chat established during the first cycle of the intervention, the author used the opportunity of the parliamentary elections in October 2021 to ask the students to express and because within the group whether their media competences, but also civic participation attitudes and experience have changed. Three students used the opportunity to fill the adjusted survey used in the first two cases within this intervention on-line. In the fourth phase of the second PAR cycle, the audio recording of the focus groups was transcribed and thematically coded (Cohen et al., 2018).

And finally, in the fifth phase, data gathered from both cycles was analysed using reflexive thematic analysis (Braun & Clarke, 2019; Byrne, 2021), which means the analysis took place on the intersection of (1) the data set (2) the theoretical background of the study (3) analytical skills/resources of the researcher (Braun & Clarke, 2019). Although there was

no goal of exact und universally valid coding and analysis in this type of analysis, the recommendations of the founders of the reflexive thematic analysis were respected (Braun & Clarke, 2019, p. 594) and another researcher, author's colleague Jakub Hodboď, joined the analytical process, to increase the richness of the interpretations. Eventually, the findings were discussed with the participants via the shared Facebook group.

5   FINDINGS

The presented intervention had three main goals: to improve media competences and CP skills, and to explore the specific needs of disadvantaged youth in the field of MLE to support CP. As a part of this, functionality of a set of twenty characteristics of teaching MLE methods was observed. The following theme presents the findings.

5.1   *Media Competences vs. Civic Participation*

This section explains how the students' immediate MIL competences improved, while change in their long-term attitude to civic participation remained ambivalent.

When choosing the central topic for the parade, the students researched and reflected the problems surrounding them. Once the topic was chosen and explored, they discussed how to reflect upon their various possible audiences and suitable media channels to reach them. This sometimes led to important realisations: "I knew one can use social media for political participation. But I never realized that I could do it. Then I experienced the process live" (student participant – SP 3) (Fig. 10.2).

For all the student participants, this was the first time to create media content with a political and civic purpose. And creative production was what these students, who were in the end studying the creativity-based 'decorator' programme, appreciated the most within the project; 'making the masks was the best, I had never worked with clay, and it was just so cool to feel it taking shape' (SP4) (see Fig. 10.3 below). The students also used Photoshop for the first time in their life during the project and enjoyed it: 'It took me some time to figure it out, but I enjoyed it and I hope I can use Photoshop later at work' (SP3). When spreading the message about the project, the participants learned how to target different audiences: local journalists (with press releases), the general public (with their social media content), and tourists and the general public (with the parade).
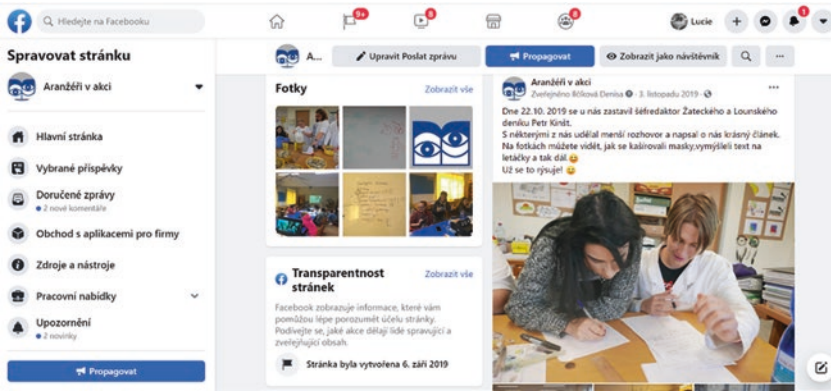
Fig. 10.2 Screenshot of the Facebook profile of the project, run by the students

Fig. 10.3 Students moulding masks

Twelve of the seventeen students participated in the final parade. TP1 said the students were especially motivated because the media was covering their project. This nurtured their self-confidence and their curiosity. 'When the journalist came and started taking their pictures, they felt like

they achieved something, like famous, and they completely forgot the preceding fights' (teacher participant – TP 1). The publicity also helped convince the parents of the students to support the project: "My parents did not want to let me go to Prague, but then they heard my interview on the radio and said that I spoke well. So, I could go to Prague" (SP3).

The increasement of their media competences was confirmed also by the preliminary and final survey. For the statement, 'I know how to use digital technologies to influence public debate', the value of the students' the answer increased from 4.07 at the beginning of the project, to 5.75 at its end. A similar enhancement was observed for the statement 'I know how to use media (in general) to influence public debate'. For increasement for the thesis 'I know how to use social media digital technologies to influence public debate,' was even more dramatic, rising from 4.36 to 7.75.

However, the improvement of their motivation to participate further in civic actions as well as their civic participation skills remained questionable. Only the students with less challenging family and social backgrounds demonstrated a wish to continue civic action in the future. The internal teacher, with whom the author has stayed in contact, confirmed in one of the focus groups which were part of the second cycle of PAR that part of the students still had interest in such activities (Fig. 10.4).

> Two students joined the workshop Academy of young citizens. One of them keeps talking about running for the parliament. Five students keep posting comments on animal torture [theme of the project] on Facebook (TP1 in focus group).

But, as Buckingham says, youth cannot be labelled as homogenous category (1993, pp. 7–18). As shown in the surveys, interviews and field observations, the motivation to participate civically remained low for a part of the class. For example:

> I have never cared about politics. There has never been an issue that would bug me enough to try to do something about it. And the project has not changed this (SP2).
>
>   I still think that civic participation makes no sense. People are bad, have been bad and will be — there is no way around I (SP1).

Although average value for the statement 'I know how to affect public debate' increased from 3.64 to 4.64, the average answer value for the statement 'I would like to participate in another project that wants to change some public issue' dropped from 7 to 5.82 points in the surveys.

Fig. 10.4 Students from Louny marching in the Charles bridge in Prague. In front is the judge, surrounded by horses

The internal teacher explains this ambivalence by the time constraints of the intervention. Three months are not enough for such complex topic for part of the students, she said (Fig. 10.5).

> At least two months more would have been needed to gain their trust. And also, to explain the deeper relationships between public debate, law, and politics (TP1).

5.2   *Specific Needs*

Most of the 17 students had challenging backgrounds. One under-age student had a child, another came from a family where several members were in prison. At least three students were active drug users according to

Fig. 10.5   Watched by a crowd in the centre of Prague

the internal teacher. One student had experienced severe bullying. Five participants had official diagnoses of learning difficulties (dyslexia, dysorthography). Four students had to work part-time to help support their family financially. Many students struggled with low self-esteem. Said by one of the students:

> I don't care about the outer world. When people ask me what I think, I say nothing. Whenever I have tried to speak, everyone has always been mean to me, including the teachers (SP1).

The students had never experienced MLE or education in civic participation skills. They also had little experience with school group work. A lot of time was thus spent explaining basic theory. The most challenging task in the project was the choice of a topic on which to work as a group. The pedagogical team could have chosen the topic for them, which would have been faster. But the choice was left to the students, and it was accomplished by a mix of reflective methods, such as individual and group dialogue, individual sketches, visualizations, and multi-round voting. 20% of the project's time was spent on choosing a topic but allowing the participants to choose it proved to be crucial for keeping them motivated.

Table 10.2 Have the recommended characteristics of MLE teaching methods towards citizen participation showed as functional when working with disadvantaged youth?

Characteristics	Confirmed?
Playfulness	Yes
Relevance for life and job	Yes
Using social media	Yes, especially Instagram and Facebook
Interactivity and participation	Yes
Clarity of the topic	Yes, visual examples are especially helpful
Current	Yes
Authentic interest of the teacher in the topic/method	Yes
Adequately long activities	Yes
Creative production	Yes, crucial.
Blending in- and out-of-school life	Yes, crucial.
Group work	Yes, very challenging for these students.
Allowing the experience of success	Yes
Using no free time of students	No. Students stayed at school also after the classes.
Connecting students with the broader community	Yes.
Breaching school routine	Yes
On-line and off-line connected	Yes
Stressing emotions	Yes
Non-hierarchical approach of the teacher	Yes
Using digital technologies	Yes

"Choosing it ourselves definitely helped our motivation" (SP3). Constant encouragement and praising the students for every small success were of further help. Further observed characteristics of teaching methods are summarised in Table 10.2.

The project also had unintended positive impact on the self-confidence of the group. 'By working in a group, the project increased self-confidence also to the less skilful ones. There was always someone who could help them, and they experienced the shared success of the group' (TP1).

6   Conclusion

The aim of this chapter was to better understand the options and limits of media literacy education (MLE) to support citizen participation (CP) at vocational schools in the Czech Republic and to assess the possible specifics of MLE of disadvantaged youth.

MLE in Czechia has significantly developed since 1989 (Jirák & Zezulková, 2019). It is now compulsory at elementary schools and grammar schools. As for the vocational schools, however, it is not obligatory, although media literacy seems to be a prerequisite to full civic participation (Mihailidis & Thevenin, 2013; Livingstone et al., 2007). This could be, in the end, observed also in practice, for instance on the *FridaysForFuture* and *DREAMers* movements, or in the past during the Czech protest week *Týden neklidu (Week of Unrest)*. The students at Czech vocational schools are thus stuck in the space called Jenkins et al. (2019) 'participation gap'.

The research presented in this chapter was inspired by the findings of numerous studies, according to which the citizenship model of MLE (Hobbs, 2010; Kahne et al., 2012, p. 4) can be the tool to narrow down this gap. The volume of both empirical and theoretical research of MLE towards citizen participation is growing, yet this work is unique with the data from Central Europe (and unique within the Czech Republic where the MLE research has been traditionally focused rather on the elementary schools and grammar schools). In line with the current research of MLE towards citizen participation (Brites & Castro, 2021; Hobbs, 2013; Kotilainen, 2009 and others), the focus was also focused on the specifics of MLE with disadvantaged youth.

The methodological tool of the presented chapter was participatory action research (Bradbury, 2015) based on a three-month-long intervention at a vocational school in Louny. 17 students aged 17 to 19 participated in a set of online and offline media and civic-participatory activities in 2019. A large amount of multimodal data was collected and analysed (15 interviews with students and teachers – 9 in the pilot study and 6 during the intervention, 2 research notepads, three sets of surveys, material artefacts, digital artefacts). These included the preparation of masks and pamphlets for a parade in the centre of Prague at the occasion of the celebration of the anniversary of November 17th, joining the so-called Velvet carnival. They also communicated with the public and local media (by organising a press conference, through a press release and on social media). Further, the students learnt to reflect various audiences and to use a broad variety of off- and online communication channels. By presenting a specific method how MLE towards CP can be taught at Czech vocational schools, the chapter joined the group of other

MLE-towards citizen participation projects such as *Student Voices* or *Project citizen*.

The chapter contributes to the international debate of the past 10–15 years, whether MLE should extend its goals beyond the generally accepted ones (Aufderheide, 1993) also towards the development of CP skills (see, e.g., McDougall et al., 2014; Hobbs, 2010; Mihailidis & Thevenin, 2013). The author concludes that the presented intervention improved the media competences of the participating students. However, part of the participants faced such difficult life conditions (bullying, drugs, teenage pregnancy, family members in prison, etc.) that the relatively challenging development of CP skills was improved only to a limited extent. Further research on whether and how this goal could be reached also among this youth would be needed.

The study observed a set of 20 characterising of teaching methods of MLE towards CP. Many of them proved to be functional, for example, the blending of online and offline activities (Livingstone, 2016), of the school and private life of the students (Buckingham, 2019) and other ways of breaking the school routine, but also the non-hierarchical approach (Bruinenberg et al., 2019), cooperation with a broader community (Malka, 2016), and creative production (Hobbs, 2013; Kotilainen, 2009). For example, the presupposition that vocational school students are not willing to invest their free time in the MLE project was rejected.

Secondly, the ways through which MLE can support the students at vocational schools also in CP were explored (by testing a set of MLE methods characteristics and by testing a specific project itself). In respect to the findings of the pilot study, stating that the average amount of MLE classes at vocational schools consist of 6 classes per academic year, the application of the citizen model of media literacy in Czech vocational schools seems to be quite a challenge. It is likely that until the introduction of MLE as a firm part of the curricula, it will be difficult to enforce more MLE at Czech vocational schools, and the more difficult will it be to push towards more MLE towards CP here. A better interconnection of the vocational schoolteachers of MLE might be of help.

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Evaluating 'Meaningful Connectivity': Digital Literacy and Women in West Bengal, India

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1 INTRODUCTION

On 22 January 2020, a twenty-year-old woman, Chumki Khatun, was cornered by a largely female mob in a village called Gourbazar in Birbhum district in the Indian state of West Bengal. It demanded to know why she had been photographing the village women and collecting data from their 'Aadhar' (a national identification) card or voter cards. The confronted young woman was unable provide a satisfactory explanation. Although timely intervention from the local police ushered her to safety, Khatun's house was vandalised. This was prompted by a collective charge from the

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village community against her being an agent for the National Register of Citizens (NRC).[1]

What Khatun had failed to convincingly articulate to her antagonized audience, however, was that her business in Gourbazar was in no way connected to the Indian government's passage of the Citizenship Amendment Bill (CAA) (Gettleman & Raj, 2019), which favored all religions in South Asia except Islam as a criterion for determining if illegal migrants in India could potentially become citizens. Aligned with the ruling Bharatiya Janata Party's (BJP) election promise of a Hindu nation (Chaudhary & Marlow, 2019), following the CAA, the Prime Minister Narendra Modi-led BJP government also pushed forward the NRC to identify illegal migrants to India, (Tiwary & Dastidar, 2019). Far from being a government agent, she was a ground-level digital literacy trainer, one of several thousand that were part of a programme-initiative launched in July 2015 in India. The concept for this programme was generated and funded at a pan-Indian level through collaboration between Tata Trusts, a key philanthropic body in India, and Google, with seed support from India's Intel Corporation. The initiative partnered with grassroot-level NGOs and local governments, who were the interface with those like Khatun, for its implementation. This programme, Internet-Saathi, was envisioned to enable "women in rural areas to use the Internet and benefit from it" with hope that the initiative would "bridge the technology gender divide" in India (Menon, 2015). In this regard, the term Saathi – meaning 'companion' or 'aide' – itself is evocative.

While Khatun's instance is extreme, when juxtaposed with the intended vision of the programme, it is a provocation nonetheless to interrogate how women in rural India, digitally literate or otherwise, manoeuvre being aberrations when they occupy and operate in a public sphere or space. By tracing individual experiences of a specific group of Internet-Saathis with the programme during and beyond its deployment, this is the imperative that we pursue, analyse, and explicate in the present article. In our study, this group comprised eighteen women in Purulia, a district in West Bengal itself, a little over 100 km away from where Khatun was confronted in Gourbazar. As its point of departure, rather than a macro-view, our study and its findings are based on insights gained from the more granular, subjective, and reflective narrations of these individuals. Purulia,

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[1] https://scroll.in/article/951523/ground-report-how-intense-fear-of-nrc-is-sparking-violence-in-rural-bengal.

a largely rural district, was also the Internet-Saathi programme's flagship site in West Bengal, commencing in June 2016 (Paul et al., 2017, p. 152) and concluding in mid-2019. Viewed this way in a continuum, rather than 'before-after' stable states, deeper insights are gained into the nature of these women's engagements, the challenges they individually or collectively faced with learning about or using the internet, what they do with it, and also what they cannot or do not. This provides the opportunity to move productively beyond polarizing views of whether the programme was a success or failure, but closely follow what the contours and implications of gaining access to the internet and its presence in everyday lives of these women are and how/if they were translated into meaningful connectivity (A4AI, 2020). In examining their manoeuvres as women in rural India, we demonstrate that – in varied ways – societal and cultural confines in their specific as well as combined lives are as constant 'companions' to them as their access to the internet or digital literacy are. These two aspects of technologies and society, we argue, co-exist in uneasy, and unexpected, ways in lives of the Internet-Saathis.

2   Intellectual Context, Conceptual Framing, and Approach

Contradicting a one-size-fits-all approach to solving social problems, Robin Mansell (2012) has queried by whom and for whom technological innovations are actually being structured. In the age of Manuell Castells' informationalism, where global capitalism enlarges its playing field to spread ICTs, it is important to ask if every community or group has the capacity to take part equally (Van Audenhove, 2003). A cause-effect relationship between ICT diffusion and development is misleading because conditions and complexities of varied contexts or cultures complicate it (Avgerou, 2017). There is a paucity of unified narratives and a knowledge gap on successes of interventions in the context of many developing countries (Sein et al., 2019). This may possibly tie up with how the Internet imaginary is based on an 'idea' of an inherently even distribution of networks despite a hierarchical organization in both its material infrastructure and the way users pragmatically reach information. Influential communication scholars such as Van Dijk (2005) have likened this to what sociologists Merton and Zuckerman originally termed "Matthew effect". Moreover, a recent study explores the extent to which various (non)-users

can be subjected to mechanisms of inclusion or exclusion, consisting of eight profiles of digital inequalities, ranging from deep exclusion to deep inclusion (Asmar et al., 2022). In such a reading of 'accumulated advantage', gaps between the advantaged and disadvantaged groups persist through social exclusion and stratification, despite ICT intervention.

> Preventing women from having a digital life is an extension of the long deprivation of access to public space that women have struggled with for centuries. Turning this around is tantamount to addressing discriminatory institutional and legal policies and cultural norms, which is no small challenge. (Arora, 2019, p. 11).

This provocation by Payal Arora brings to the fore that women form both a cross-cutting as well as subset category within the larger frames: global, regional, national, or even sub-national levels of consideration, in how the ICTs and societies interact. However, it is important to be cautious of approaching the discourse on women in a general sense. Even as a gendered category, women are far from uniform – even when viewed through socio-economic lenses like 'global south', regional ones like 'South Asia' or geopolitical and national-territorial ones like 'India'. Other granular studies like Sarkar (2016), Pokpas (2017) demonstrate that several interim stages lie in between the poles of a condition that prevents women from the digital life or unchanged status in society and providing ownership or access as a 'solution'. It is here that our research seeks insights into the *continuum* that is at play and *weighing the process* of how lives are impacted by a ground level initiative in a specific moment and context. Oury study is interested in pursuing what Anita Gurumurthy (2013) terms 'participatory citizenship'. She defines this as how social and political participation of women can be traced by connecting digital space and public spheres. Elsewhere, she critiques the ICTs failure to be 'productively disruptive' in women's favour in general and more so in rural areas (Gurumurthy & Chami, 2018).

We frame our investigation through three interrelated concepts. The first is the Capability Approach (CA) that Amartya Sen and Martha Nussbaum developed in welfare economics in the 1980s. Its compatibility with our inquiry is in privileging the role of self-education as a facilitator of development and not mere propagation of technologies (Van Audenhove, 2003). It also draws a useful philosophical distinction between means and ends. In the sphere of the ICTs and societies, many studies over

the years have used CA to map contributions to development (Hatakka & De', 2011; Kleine, 2011; Thapa & Sæbø, 2014). By focusing on social dimensions, CA frames development as a route to enhancing people's freedoms, within their socio- economic arrangements, political and civil rights (Sen, 1999). Building upon the CA, moving beyond the utilitarian roles of technology, Yingqin Zheng and Bernd Carsten Stahl (2011) argue that the ICTs co-evolve with values and choice, and technology may influence people's agency in choosing and attaining its functional capacities meaningfully. In this case, within such a Choice Framework (CF) individuals use their agency to navigate the ICTs' structures to be in a position of making choices. According to Kleine (2009), choice can be multidimensional (degrees of empowerment): it should also exist (existence of choice); individuals need to be aware of it (sense of choice); they have to be able to exercise it (use of choice); and then its effectiveness may or may not materialise (achievement of choice). The existence and sense of choice is a lens through which capabilities in personal, societal, cultural, or political lives can be interpreted. In such a way, the CF supports a holistic view of 'capabilities' via Sen through its core ideas.

Our focus on rural women in a particular region in Bengal potentially facilitates a deeper understanding of their structural and functional capabilities and choices, and the role of ICTs in them. Here, we combine the CA/CF framework with a socio-psychological concept, "mattering". Mattering is embedded in theories of agency and empowerment, and when used to frame the ICTs in a development domain. It brings sharper focus on how "others depend on us, are interested in us, are concerned with our fate, or experience us…" (Rosenberg & McCullough, 1981, p. 165).

Mattering in social psychology literature refers to three dimensions: awareness, importance, and reliance. Awareness refers to the "merest of senses if others realize that we exist", importance is "extent to which people are the object of others' interest and concern" whereas reliance entails "the extent to which others depend on someone" (Elliott et al., 2004, p. 340). It is an important part of an individual's self-concept and their sense of where they fit in their social environment. For those in marginalised societies, and especially women, an individuals' self-concept may comprise the sense of her relevance to others around her, a judgment regarding the extent to which his or her advice is valued and, an assessment of how much concern others have for them (Chew et al. 2015). The experience of having a say in who they are and a sense of what they do

matters may lead to a greater motivation to take risks, to innovate, and to be meaningfully 'empowered'. In this manner, our study – even in focussing on a narrow group – illuminates the more general cognitive aspects of agency and capability. Examining this in the empirical context of our study, we take cognisance of the complex, non-linear relationship between social and digital entitlements.

Proceeding with this conceptual approach, our study was configured through an analytical framework that took into account these myriad dimensions of capabilities, choices and mattering. In order to foreground, in a bottom-up manner, the voices of the participants in informing these interrelated aspects, the framework was developed to privilege the experiences of the Internet-Saathis themselves through the following components:

- *Existing barriers and starting capacity:* The ICTs benefits argued in favour of a trickle-down approach are interrogated through extant societal structures negotiated by individuals. Given that these benefits are moderated by social approval education and prior conditions, the category of 'women' itself emerges as non-uniform.
- *Digital literacy experience:* Given the premise of how ICT interventions being deployed top-down having limitations, it was important to understand the ways in which the 'technological solution' of a digital literacy programme was being utilised by individuals in their learning and teaching experiences.
- *Notions of 'value', as conceived, perceived and lived:* The individual-specific 'datum' (or starting capacity) will position how value addition has occurred through the ICT intervention. This became crucial in assessing improved capabilities and capacity for exercising choice.
- *'Mattering' to self and to others:* This aspect pursued insights on complex negotiations needed between practical and strategic interests, the ability to influence peers, or even the community in general, as visible through activities of the Internet-Saathis. This allows querying to what extent beneficiaries of the ICT interventions in the digital-literacy programme are publicly vocal about their concerns and consciousness.

3   Context of the Programme, Empirical Study and Method

The term Internet-Saathi has two valences. It is a programme as well as an individual agent embodied in the figure of the rural Indian woman. Here, it is pertinent to mention that the programme was modelled on a train-the-trainer model. In addition to using the 'hook' word, Saathi (companion), it also reverted to an image that is easily associated with rural India, the bicycle. The bicycle given to an Internet-Saathi – here, the woman, was not an ordinary one. It was endowed with a cart with all the necessary paraphernalia for its rider to access the internet for utility or entertainment – a tablet device and two smart phones supported by a mobile internet hub. This rider would make the rounds of public areas in a set of villages assigned to her at least twice a week for a period of four to six months. The intent was to induce other women into the digital sphere through her own and the women's hands-on experience of using the internet through these devices. Based on this, our study has viewed individual Internet-Saathis as both recipients and agents of digital literacy.

In studying such and similar initiatives through a gendered lens, Anita Gurumurthy and Nandini Chami (2018) present a rare study that looks at these claims in a critical manner. Although they do not undertake an in-depth or focussed study of the programme itself, their report is sceptical. It states that the: "Internet Saathi digital literacy initiative for rural women, partnering with state governments to empower women and their enterprises through use of modern technologies" has a rhetorical bent towards "digital by default". In their view, such an initiative "largely ignores and even undermines marginalised women's rights to life, livelihood, privacy and dignity" (p.60).

Such doubts assume significance when juxtaposed with the country-wide narratives how rural women developed "better understanding" of the internet, "positive economic impact" on them or even their "improvement in social standing". This is where the particularities of their personal and lived experiences with this initiative gain currency, as does our study, as arguably being an early examination that inverts the perspective. Rather than view the programme through its high-profile proponents and organisations, we have attempted to understand the initiative through actual narratives of its stated beneficiaries in the context of Purulia, not in statistical or quantitative terms, but through their individual and subjective experiences.

Here, our study was deployed based on a set of robust working-hypotheses that supplied the apparatus to frame more precise questions for the selected participants. The 17 participants who formed the 'unit of analysis' were selected through the lens of Centre for Environmental and Socio-economic Regeneration (CESR), a local NGO in Bengal who were Google's implementation partner for the Internet Saathi program.

The 17 interviews were semi-structured, conducted between March, 2020 and May 2020, in order to capture the individual subjectivities of the respondents and also find comparable and contrasting patterns. The transcripts, based on the questions, and also the free-play of conversations yielded, but were not limited to, five interrelated types of information: background, experiential, actions, reflections and anecdotes. In the context of Purulia, where the programme was deployed, the participants in the study represent fifteen settlements (or hamlets) under the administration of ten discrete 'Gram' or village level Panchayats, the lowest executive and spatial level of governance in India (see Fig. 11.1). These village panchayats are distributed in varied areas ensuring representation of various different zones within the district (Census of India, 2011). The names of participants vide ethical frameworks and considerations have been changed in this presentation. However, other various aspects: age, educational level, marital status, having children or not, and present occupation were considered relevant to analyse the findings (see Table 11.1).

This range of information helped to firstly, understand the participants' family conditions, educational levels, marital status, or children, as well as occupations. Experiences, further, clarified the difficulties or ease of engagement with the internet in general on the one hand, while also allowing narrations of barriers at the levels of family or immediate community, on the other. It also revealed their experiences of self-learning and/or their ability to induce others' interest to learn and engage with the ICTs. Additionally, the Saathis' narrations on actions and their reflections, since the programme had ended in Purulia, was crucial in learning how and to what extent they operationalised the knowledge of ICTs in both personal and wider communal or societal terms. These also revealed their perceptions of value addition to their own lives, as well as the potential to transfer this value to the community, if they were aware of entitlements and responsibilities, conscious about a public self, or even discerned between true or untrue received information over the internet. And finally, most participants were able to articulate reflections and their reflexive knowledge more clearly through actual incidents or happenings rather
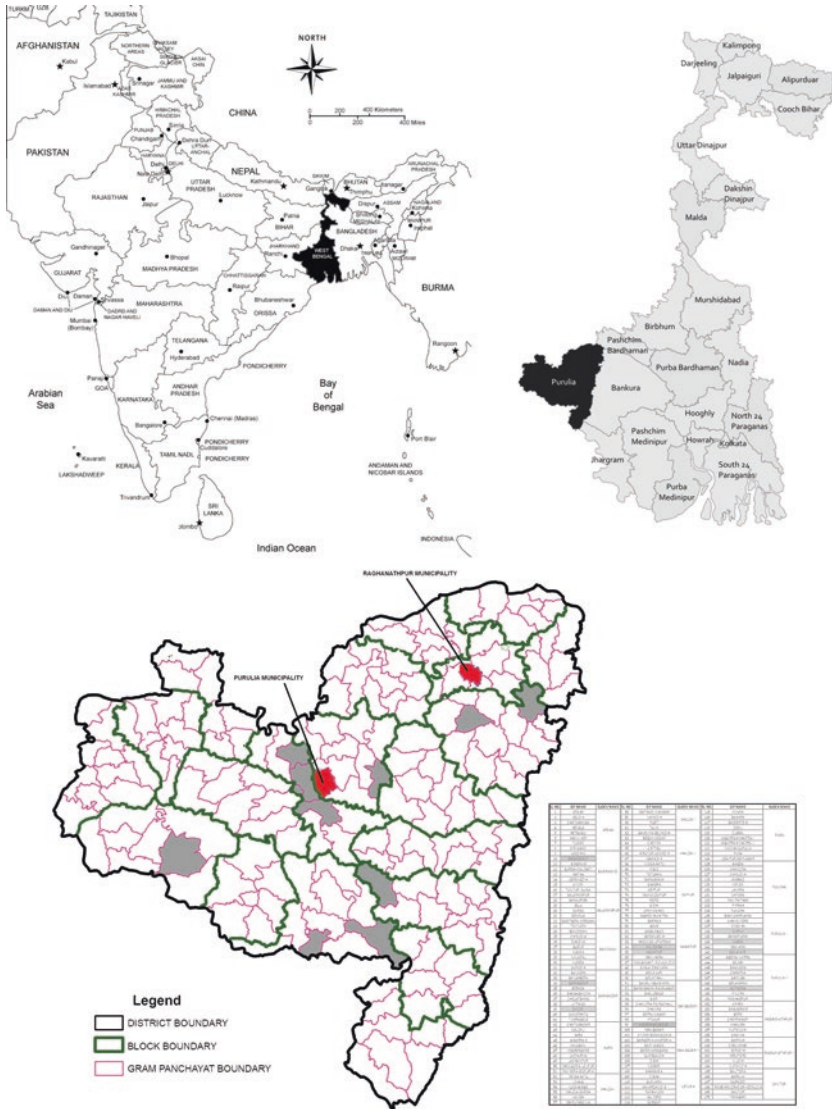
Fig. 11.1 Study location

Table 11.1 Overview of personal profiles and present circumstances of participants in the study

Name (changed)	Age	Village	Education level	Marital status	Child	Present occupation
Namita	28	Kamta	Bachelor's deg.	Widow (m. 17)	1	Caretaker at an office
Lalita	28	Patahesal	High school (dropout)	Married	1	Informal e-business at home
Krishna	33	Pathariagora	Secondary sch.	Married	2	Gram-flour mill, informal home businesses
Rukmini	22	Satar	High school	Married	1	Housewife
Padmini	24	Kasipur	Bachelor's deg.	Single	0	Private tutor
Chameli	30	Shrabundi	High school	Widow	3	Farming/ informal e-business
Poornima	23	Bakhonbari	Bachelor's deg.	Married	0	Housewife
Bakula	22	Shiulibari	Bachelor's deg.	Single	0	Private tutor, preparing for govt. job
Mousumi	35	Lakhanpur	High school	Married	2	Local politician
Shyamali	27	Barabazar	Master's deg.	Single	0	Private tutors, jobseeker
Piyali	27	Simulia	Bachelor's deg. (dropout)	Married	1	Housewife
Mitraa	35	Lagda	High school	Married	1	Social worker
Disha	21	Agordin	High school (result awaited)	Single	0	Student
Anila	24	Sindri	Bachelor's deg.	Single	0	Data-entry operator

than in abstract or conceptual terms, which is why the interviews also privileged anecdotes. These text-based interview transcripts and their resulting findings were coded, codes were categorised and analysed to enable a clear comprehension and, subsequently, interpretation of the responses by evaluating them within the aspects of both domestic and public transformations in the participants' lives.

4   Tracing Digital Literacy: Goal or Means

The findings and observations from these transcripts significantly recovered experiences and reflections of the Internet-Saathi participants that contributed to this study. By privileging and enlarging the process of
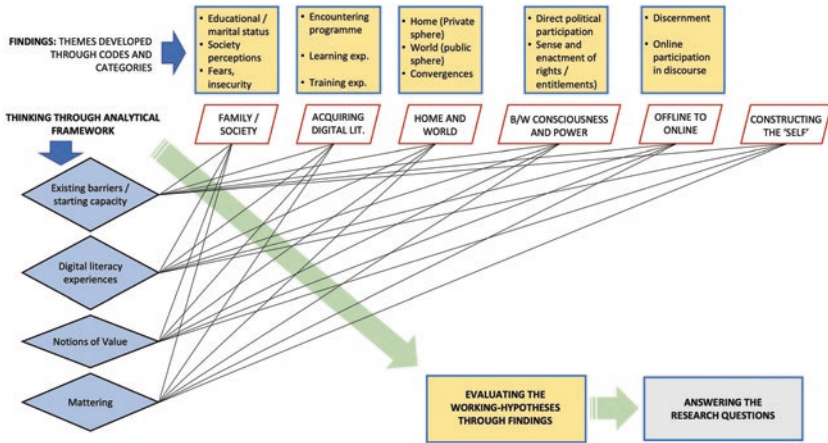
Fig. 11.2 Study co-relationships and dependencies

change in a continuum, rather than attempt to establish a stable state, we present these aggregated experiences and correlate the findings and their sub-components to each of the four dimensions of the analytical framework. The co-relationships and dependencies have been thought through, rather than a linear cause and effect, a matrix of correlations as represented in Fig. 11.2 below. On the whole, processing the findings move from the 'what happened' aspect to the 'why it happened this way' aspect. For instance: why do the participants feel that acquisition of digital literacy contributes to an enhancement of not only their economic opportunities, but also accords them increased social capital? Conversely – even with the agency to participate in digital platforms – why do they not comment or engage in public discussion online with political issues that concern their social existence? These finer issues, when closely read through the nuances and spaces between the participants' reported responses, yielded dimensions which can be built outward from the individual to social levels and to explain the contradictions and still-existing barriers in this continuum where digital literacy is variably a goal, as well as a means.

4.1   *Knowledge Appetite as Capability*

The most consistent refrain across all the participants was their attributing unequivocal importance to the internet as a means to expand their

individual life-worlds. This, as evident through their testimonies, was not about a mere utility of gathering data or information alone, but a pronounced 'knowledge appetite'. This was the recurring aspect to which they attributed value, at a personal and an existential level, as reflected even in the varied responses of the internet's indispensability to daily life and lived experience. Every participant found it difficult to ignore that now that they knew more, still more could be known. Having a phone with access to the internet, this value could potentially be taken advantage of, flexibly. In these women's lives, such flexibility was paramount since it meant that their engagement with online activity could operate within 'offline' constraints of housework, even occupation or studies. By all participants, this feeling was conveyed – primarily – to be a personal one, that as following discussions will explain, expanded outwards to become social.

While to some women, this manifested in the form of having access to personal entertainment without owning an expensive television set or satellite / cable connections, to others it was accorded value by being able to access variations in the things they already did, like cooking, sewing or even handicrafts. For some, it promised the potential of checking up or verifying study-related or vocational information, including searching for jobs and eliminating dependencies on middlemen. For others still, it was possible to visually experience places that they could not afford to physically travel to. As much as the distant and inaccessible, the internet's multiscalar nature could also provide access, as some participants reported, to information about the local context. This was best encapsulated in how Anila related, rather plainly, about how she installed the 'Public' app on her phone that gave her the most updated information on her own district from what she thought were reliable sources.

4.2   Socio-economic Independence as Capability

Despite variations among the participants' own backgrounds, a recurring narrative was on the high degree of value all participants placed on being independent in socio-economic terms. It is true that several of the women who were trained as Saathis carved out opportunities for themselves in myriad ways through access to online information and knowledge. This ranged from micro-level activities such as professionally making, packaging, and selling food items, clothes or accessories in the immediate and wider neighbourhood, or looking for job opportunities and paying for utilities online, to even in one case, enhancing future aspirations as a

politician. However, it is important to be cautious of inferring hastily that this is an isolated phenomenon related to creating livelihood or income opportunities alone.

Here, it is important to recall that in the Saathis' experiences, regardless of their backgrounds, the job entailed not only self-learning but also training others. So – by default – for those who had barely left home for work previously, the work as an Internet Saathi was not one that could be carried out in isolation. By its very nature, it necessarily brought these women into contact with other people who were by and large strangers to them. Therefore, for those who had been confined to households previously, exited their homes and entered an employed and wage-earning labour circuit. Simultaneously, they were also compelled to operate in a public sphere. As reported by all Saathis, the work required a substantial degree of convincing others who displayed considerable scepticism on the merit of 'allowing' other women initiation into and engagement with the internet. These sceptics ranged from entire communities, elder male members, fathers or husbands, and the potential women students themselves.

As a result, firstly, the work as an Internet-Saathi needed a certain degree of self-conviction and confidence to work outdoors in unknown physical and social spaces. In this regard, the Saathis' collective experience created a level playing field irrespective of having had prior exposure to computers (which they reported to have forgotten), those finding it difficult or, even those being at ease with mobile-internet and smartphones during their initiation as Saathis. As one such woman who was completely comfortable with smartphones even before being an Internet Saathi, Padmini, asserted, "What I learnt there was training methods: how to actually go on the field, talk to people and teach them new things. That part of the training was very helpful…"

Secondly, and significantly, this points to an important subversion of the assumption that digital literacy is a 'goal' in ensuring access to such a programme. The experiences narrated by its participants transcended such stated aims, even those on the mere creation of livelihood. As evident, the Saathis testified that the value of personal development was deeper. Through imbibing soft skills, or activation of a 'public' self, this was at par with, if not being more valuable than, acquiring livelihoods and digital literacy alone. It manifested in perception of their enhanced position and confidence in the public sphere. Given that they were carrying out this job even at an anticipated – and as Khatun's experience demonstrated, real – risk to personal safety, many Saathis were overcoming the very fear and

insecurity that characterised a feeble confidence level at their starting capacities. Through these multiple and interrelated dimensions, then, they were placed into the process of acquiring, as well as self-perceiving an enhanced state of capabilities through the programme.

4.3   Sense of Entitlements and Rights as a Sense of Choice

In combination, these aspects co-produced another significant attribute among the participants: a 'sense' of choice. The sense of choice developed in varied ways. It is equally important to examine, concurrently, to what degree the participants have 'used' their choice, and 'achieved' what they consider valuable within the choices they construct through digital literacy. These lateral connections are drawn in the present discussion.

To an extent, it has been unsurprising to note that some of the prime deprivations of the women participants in this study was choice-related, on account of their gender. Rukmini's was a particularly tragic case. She narrated a series of diverse aspirations that were side-tracked since she was the only girl among her other four siblings. Art, dance, cooking, spoken-English, being a beautician or even sewing were rejected in favour of marrying her off immediately after high school. Comparably, Anila could not occupy a very secure government job in the Central Reserve Police Force, even having been selected for the position. This was on account of her mother's resistance, since her post of duty was situated 119 kilometres away from her home.

Such occurrences had been normalised in these participants' lives. But knowledge gleaned from regular internet access was instrumental in activating a sense of deprivation about these retroactively, and conversely, the choices they had not been allowed to make simply on account of their gender. In reflecting upon these pasts, we received a nearly unanimous response on their consciousness or 'sense' of how what had happened with them was not acceptable anymore.

Speaking in more instrumental terms, this was the reason why some of the participants were impassioned advocates for female adolescent rights, raising awareness on their sexual and reproductive health and ill-effects of underage marriage. This was consistent across both participants who were married underage themselves and those who had exercised their own choice of continuing their education and pursuing a career over early marriage. But, on the whole, tangible actions were taken by less than half of the total number of participants we spoke with. Conversely, their use of

choice barely transferred very successfully into other public spheres. Herein, as evident from the findings discussed in the previous chapter, a stiff contradiction emerges. The sense of choice was usurped by the sense of fear in being overtly vocal in a socio-political public sphere as a woman, whether offline or online.

With the few exceptions such as Mousumi, the practicing politician backed by a family pedigree and Lalita, exercise of female choice was limited to softer measures like advocacy and counselling. Anila was a key exception but still falling short of satisfying the use and achievement of choice to a substantive degree of freedom. She narrated how she had viewed a post on Facebook where local political representatives claimed that a public water-tap in their village (which incidentally was close to her home) was in immaculate shape. Knowing very well the ground condition; the infestation of the tap with insects and pests, she exposed the lie and doctored photograph by commenting on the post and sharing a real photograph online. However, to do this, she hid behind an anonymous account. Even if Anila's move was strategic and inventive, her having to veil her identity despite her educational background or sense of exercising an instrumental choice and voice to speak out suggested that, she lacked confidence and security about acting upon and achieving this choice as an identifiable woman.

4.4   Enhancement of Social Capital as 'Mattering'

It is pertinent to view the analyses of the aforesaid three crucial and inter-related dimensions, as both emerging from and converging on an aspect of 'mattering'. This occurs in independent as well as relative terms among 'others' in their community, while also projecting outwards to specifically include members of their own gender in the public sphere.

Such mattering is, firstly, an internal perception. Equally, it is mediated between self-esteem and well-being through family, friends and acquaintances. With perceived values added through knowledge of the internet, even if limited, high self-esteem reported by our respondents meant they felt more confident in relating to these groups. They were more likely to feel valued by them, believing they could positively contribute to such relationships. An enhanced sense of mattering was also induced when other women from the community came and asked for help from them. This occurred, for instance, when girls who looked up to them asked for advice on how to lead a similar life. It, thus, derived from self-perceptions

of being important for others, on the one hand. On the other, it spanned the spectrum of people or groups that were more powerful (seniors, elders and mentors) as well as less powerful (proteges, emulators) than the individual concerned.

The findings also reflect that a stronger sense of self appeared among these women, after receiving such forms of social validation from their friends and family. A link where collective informed individual identity formation was observed. For instance, Lalita's mother-in-law defending her for riding a scooter or wearing what she pleased was informed a realisation of her sense-of-self. The interrelated problems of self-recognition and recognition by others were central aspects of these women's processes in an enhanced identity formation.

All the Saathis also reported to feeling freer and more important than before. This sense of change was observed in every single respondent when their starting capacity was adjudged against reflections on how they felt presently, in other words, before and after going through the process of enacting the job of Internet Saathis. The change in both perception and utility as Saathis was not limited to the domestic sphere. It altered their engagement with the public sphere as well as being self-dependent, economically and socially. Such a practice of the new found 'digital' agency in the public sphere allowed them to navigate certain male-dominated domains in both utilitarian ways, not just for themselves but also the community they were in.

'Mattering', in this sense, is closely related to the value the participants derived from an enhancement of 'social capital' within the community. This is the 'sphere of influence' that their identities, capacities as well as choices exerted on others. Such social capital was, therefore, portable and scalable across their structures of engagement. When thought through a process in the continuum of developing political consciousness, this has occurred through their actions as trainers, in managing to successfully convince unknown groups or individuals to undertake the training, at one level. At another level, such successes – even if limited – reflexively fed back into their 'reputations' as carriers of certain knowledge that rendered them exclusive in the community at large. In instrumental terms, therefore, these two dimensions of political consciousness are also interconnected and co-dependent, drawing nourishment from enhancements in the Saathis' knowledge, capabilities, confidence, socio-economic independence as well as a certain sense of and power to exercise their choices.

4.5   The Glass Ceiling: Persistence of Barriers and Contradictions

It is paramount, at this juncture, to foreground – in being faithful to the study's focus on process – the extent to which these Internet Saathis think through, project and exercise their internal capacities (knowledge) capabilities (agency to act), choices (rights and entitlements) as well as sense of mattering grounded in social capital. Deeper and incisive reflection on such issues reveals that there is a 'glass ceiling' which perceived, reported, imagined virtues are unable to breach. It is constituted by a sliding scale of barriers and constraints, and even entitlements.

Firstly, the recurring cost and attendant network strength was one of the most consistently reported issues across the participants' experiences. However, it would be reductive to view this as purely a technical issue. In being able to achieve capacities that enable them to effectively use the internet, whether for gaining knowledge, utilities or even where any social capacity can be exercised effectively beyond the time when they were being subsidised by the programme, the Saathis' own income proved to be a major barrier. At another level, the geographical constraints that determine the network strength also came in the way. This leads to a peculiar chicken or egg problem, where even if the programme helped to 'incubate' these women as entrepreneurs, the sustained use of digital literacy, even in its limited form, was dependent on external infrastructure. This is complicated by what the GSMA (2018) has called 'application islands' where certain subsidised applications or built-in capacities of devices pose a barrier to exploring the full potential of what is online. In this case, capacities of the devices, free for use of certain applications, will encounter a 'pay wall' condition for treading beyond familiar territory, even if theoretically known by the user.

Beyond this, moreover, social issues resurfaced. These are, in a relative sense, a lot less negotiable than the individual or even technical ones. Despite the perceived enhancement of agency by the Saathis through their digital literacy experience, we asked how women navigated their enhanced capacities to map priorities in their households. While most respondents reported that men primarily used internet-enabled devices for non-utilitarian purposes, almost consistently, they said that the men in their families, wherever applicable, had the first 'right' to time on a phone, its data. The residues went to the women, who still were largely inextricable from their household duties and spaces. Oddly, this recalls other historical

forms of patriarchy in technology, for instance, when television sets arrived in India, the men in a household decided when and what to watch.

In turning to the gendered engagement with a political space, these social issues translated in both offline and online terms. The recurring issue was a disdain and disinterest in politics altogether. All fifteen but one, the elected representative in her village panchayat, said politics was a waste of time. The respondents consistently seemed to be more concerned about an immediate solution to their daily survival needs, and in terms of priorities, relegated long-term political and strategic interests to either a form of cynicism or despair, or considered it far-removed from their fields of day-to-day realities of survival and subsistence. In all, despite being digitally literate, this perpetuated the deeply-entrenched notion that it was a woman's duty to perform all household activities and men would shoulder the public and worldly concerns, which they consistently used to defend a perspective on their passive participation in electoral and party politics.

Such social issues were also compounded by a gendered 'reputation' problem, which persisted, irrespective of acquiring digital literacy. Men, these women claimed, were not limited by moral boundaries or social mores when they went online. But consistently, everyone reported that society would not take too long to blame a woman. The rules are different and one misstep by a woman on social media could tarnish her image forever. Adding to this problem was one of safety and security of their own selves as well as families. In this sense, their social capital did not transfer to online spaces. While men could impinge on the freedom of others, irrespective of gender, when voicing opinions or viewpoints, a women's 'right' or 'entitlement' to speak out online even against a freedom of pointing out injustice was perceived to be threatening if they were identifiable. This occurred in both soft forms, as harassment and abuse, and in hard forms, if the ones they spoke up against could access their homes or mobility paths.

Lastly, the social and technical boundaries powerfully converged on a cultural issue: that of language and epistemologies. Despite the potential and ostensible freedom to access any content they wished, even in their circumscribed conditions, the women reported that the barrier of language precluded their 'cognitive' access to knowledge, especially in cases when their offline education was inadequate to navigate the noise of information that was not generated in the language they were familiar with. Technically, while refining the voice search tools could potentially redress this, the much greater barrier was ignorance to cultural contexts or

references through which online discourse was mediated by algorithms privileging a net-savvy majority. Perhaps, this is the reason why a large proportion of our respondents showed inclination to learn English, revealing a prevailing neo-colonial appropriation of the potential intellectual, cultural, structural and cognitive issues that digital literacy fails to address.

5   Conclusion

To conclude, it is pertinent to begin with how, although most participants faced hurdles, equally from family members and the community, they were able to successfully participate in the programme and conduct themselves as Internet-Saathis. However, no correlation was observed between educational background and existing ICT capacities of the participants with how easily they imbibed the self-learning, where in nearly all cases, epistemological issues of language and terminologies posed key problems. Nonetheless, all participants expressed the indispensability of the internet to their daily lives, in varied ways. Such a testimony of indispensability can be expanded through aspects that were valued by the recipients of the training. In a more direct sense, the logistical and practical difficulties – related to physically having to pay for utilities, elimination of middlemen in form-filling or ticketing – were transcended. At one level, this occurred when it came to their own tasks, homes, jobs, or occupational and income opportunities. Especially those from the weaker sections of society expressed a wide range of emotions, when talking about their life before and after the Saathi experience. More importantly, acquiring skills like a limited "spoken" English proficiency, or being able to comprehend worldly affairs, otherwise presumed to be a forte of the men, or using Google maps to navigate and reach faraway places without anyone's supervision, made these women more confident and independent.

Beyond the personal benefits, however, at another level, the participants attributed greater significance – consequently value – to being able to help the community members with similar tasks, extending their knowledges into the public sphere. Here, they found particular reason to value the soft skills that they had acquired through the programme as trainers, or the ability to operate in unfamiliar and unknown environments by engaging with publics autonomously. In this sense, they perceived an increase in, firstly, social capital, and secondly, in how recognition was accorded to them by their family members, acquaintances as well as, in certain cases, complete strangers. This also improved their sense of self.

Furthermore, a small number of participants also, in reflecting upon the choices denied to them previously, extended their enhanced capacities in educating others (especially young women) about rights, choices and entitlements. On the whole, through these aspects, across all participants, the programme had induced a sense of 'mattering' of the self and also others in their own gender.

The above results may portray very positive impressions regarding implications of the digital literacy initiative on an individual or collective lives of these rural women. But if closer attention is paid to how their internalisation of it was limited only in instrumental terms, it would be rash to reach such a conclusion. This can be argued by paying minute attention to how, even when such consciousness did exist, it was largely enacted and practiced offline, that too only in their immediate public sphere of the individual concerned, or even when seen as a group. While offline inequalities were somewhat reduced with online intervention, there was also a surge in new forms of inequalities in the online sphere, like social media abuse, harassment and breach of privacy.

The first indicator of this was that while all the participants displayed a greater sense and awareness of their entitlements and choices, barely any were ready to exercise it in challenging established gender roles, outside their homes despite approval from immediate family or in the neighbourhoods. Second, even those active in the public sphere, did not consider their offline social practices 'political'. The cognition of the political was limited to electoral or party politics and was not internalised into the self. And, third, with the exception of the one practicing politician, none of the participants displayed any inclination for public leadership in a broader sense. Even in the cases they did speak out against injustices, they hid behind anonymity or veiled identities. On the contrary, engaging with day-to-day political discourse was seen with disdain and considered futile. This was even more amplified when such participation had to be enacted online among unknown people.

Such results, in order to answer the question on practice and enactment of a public self, needs to be viewed from an added perspective. Here, we shift vantage from viewing the subject-participants as political establishment continued to remain passive and barely functional. In a continuum of enacting public and political selves, this put them far behind men or even urban counterparts. A notion that the poor had to fend for themselves took precedence. Except for a few in the upwardly mobile sections of society, no one said they were interested in talking or for that matter

engaging directly with public affairs that did not concern their immediate well-being. That economic and social security was their only key to an adequate life was overwhelmingly made clear. Furthermore, even in the more private realm of engaging with online information, very few participants displayed a critical ability to discern authenticity of passed on information. It had an inverse proportional relationship with the information being from geographically faraway places, as opposed to more known environments. In this manner, the aspects of mattering did not reach a wider public or political sphere and was geographically and socially confined and delimited by a consciousness of being the 'lesser' gender. Moreover, this was complicated, in addition to patchy network strength, by their inability to manage recurring data costs, limited English language proficiency and, most importantly, vulnerability to online harassment and violence.

This study has demonstrated that a fine-grained reading of even a small group can reveal powerful insights on not only the commonalities, but also the diversity and departures of individual experiences. These individual aspects illuminate the collective experience. This, however, is also its important limitation. For instance, the group studied herein, while reflecting the realities of Purulia, does not represent an adequately large sample to draw definitive generalisations across other contexts, even in India. In a more extended project, the methodological approach we have used can be scalable. This has important implications in evaluating digital literacy's long-term effectiveness. A majority of studies and concerns reflect the problems in delivering the technology. However, a lot less attention is granted to monitoring of what happens in an extended period after a programme has been deployed. This continues to be under-researched and in several developing and rural contexts as the one we have focussed on, can yield valuable insights in how societies and technologies interact in the longer term.

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Developing and Delivering and Data Literacy

Simeon Yates and Elinor Carmi

1   Introduction

This chapter considers how to approach and develop training or community interventions designed to develop what we call *democratic education for data citizenship*. Such interventions can range from supporting citizens to understand the most basic ideas such as "what is data" and how platforms use it – for example, how Google search and web-cookies work – through to the complexities of UK and EU GDPR legislation, or how to unpick misinformation online. The goal of the chapter is not to provide a prescriptive list of "skills" nor a "one size fits all" solution. Our research (Yates et al., 2021; Carmi et al., 2020; Yates & Carmi, 2022) has demonstrated that concern about issues of data use and abuse in contemporary society is very high among citizens. At the same time awareness of the details and how to address these concerns are quite low. We also found that understanding, skills, and awareness varied greatly between different groups (Yates et al., 2021; Yates et al., 2020; Yates & Lockley, 2018; Yates

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et al., 2015). As a result, the starting point for a journey towards democratic data citizenship varies by community and audience. Meeting citizens "where they are" is key here and therefore, and interventions need to start with an understanding of their audience. Our research also made clear that the specifics of citizens circumstances, the community they are part of, and their lived experience must be considered. This best understood by citizens and communities themselves and by those working with them.

Why have we taken this approach? Why not just provide a top ten "things to do guide"?. This was, in fact, our intention at the start of the project. Designed shortly before the Cambridge Analytica Scandal broke our research project envisioned a simple guide to "data literacy" as a key output. As our research developed and identified the variation in awareness, as issues like Cambridge Analytica came to the fore alongside misinformation online, and as we talked to different communities and constituencies, it became clear the idea of a single "one-size fits all" solution or simple 'top tips' was a naive approach.

Democratic education for data citizenship is more than basic digital skills. Existing research and many interventions across the globe provide routes to the foundational skills and knowledge citizens need. Though of course our research points out that many citizens still lack these foundational components. Great resources for providing foundational digital skills and awareness, as well as context specific support (e.g. around health and finances), can be found in materials of our project partner the Good Things Foundation.[1] What we present here are our thoughts and findings on the design of interventions and educational activities to support *democratic education for data citizenship*. Section 2 below, sets the scene by explaining what we mean by Data Literacy and how this relates to ideas of Media Literacy, Information/Computer Literacy, and Digital Literacy. It also sets out the case for Data Literacy education – especially in terms of Digital Citizenship. Section 3 considers some of the key factors to take into account before designing or implementing an intervention – especially audience and appropriate learning resources. Section 4 then focuses on the areas of significant weaknesses in Data Literacy our research identified, and the concern citizens had about data and platforms. The key ones being:

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[1] https://www.goodthingsfoundation.org/learn/learn-my-way/; https://www.goodthingsfoundation.org/learn/make-it-click/.

- Understanding what data is and how digital media and systems use it to deliver services to citizens.
- Concerns about and a need to understand data citizens are sharing and 'giving' away as they use digital media and systems.
- Concerns about and a need to understand privacy in a digital and datafied society.
- Understanding digital and data rights as citizens of a digital and datafied society

2   UNDERSTANDING DATA LITERACY

2.1   *What Is Data Literacy?*

This section provides an overview of how we have developed the ideas of Digital and Data Literacy in our Nuffield Foundation funded project Me and My Big Data (Yates et al., 2021). It provides an overview of how these ideas link to related work around citizens understandings of media and information. There are, in fact, a lot of terms used to describe citizens' ability to use digital media and systems. These are often overlapping and there are few if any absolute definitions. Key ones include:

- Literacy
- Media literacy
- Information literacy
- Computer literacy
- Digital literacy
- Data literacy

We will briefly look at each of these in turn. This also forms a short history of ideas about 'literacy'. As we argue below, what is defined as 'literacy' is always about the use of the communication technologies available at a point in time. We conclude the section arguing that Digital and Data Literacy are two sides of the same coin. Taken in their simplest sense Digital Literacy addresses the nature of contemporary media systems and the skills to use them – akin to the idea of Media Literacy. Data Literacy addresses the data ecology and economy that underpins these contemporary systems – akin to the idea of Information Literacy. Hopefully the section provides you with a brief overview of how these ideas have developed and link together.

Literacy

The idea of literacy is, of course, ancient – with evidence of writing going back many thousands of years. The modern conceptions of literacy stem from the post Victorian era of mass literacy. Ideas of literacy range from the basic skills of reading and writing though to the ability to work with complex texts, be they Tolstoy or technical academic science papers. Over the years, very complex social, political, and cultural understandings of literacy have developed. These are rooted in the idea of literacy practices – the "uses" of literacy by citizens and communities. It is important to note that the ideas of Digital and Data literacy are not simply one of making an analogy between a skillset needed for 'written' texts and one for 'computer systems'. Writing is itself a technology and written literacy and digital literacy fundamentally intersect today as the majority of text consumed by citizens is provided via digital media and systems:

> In perhaps 50 years' time, our understanding of the nature of literacy and of the social functions of texts will have so radically changed that few will be alive to attest to 'how things were' at the close of the 20th century (Danet, 1997).

Literacy is therefore always about the use of the communication technologies available at the time, though it is, of course, a highly social and culturally differentiated set of practices. Importantly, certain literacy practices are deemed more worthy or useful – in other words, there are notable *value judgements* made around what types of behaviours and knowledge citizens should have. These points all hold for use of digital media and systems including the normative assumptions about what is 'good' Digital and Data Literacy.

Media Literacy

The idea of media literacy grew from applying the idea of literacy to non-print media, especially broadcast media. As digital communications technologies have come along, media literacy definitions have tried to include the breadth of broadcast and personal communications media. The UK media regulator OfCom defines Media Literacy as "the ability to use, understand and create media and communications in a variety of contexts"[2]. The Centre for Media Literacy[3] uses the following three-part definition:

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[2] https://www.ofcom.org.uk/research-and-data/media-literacy-research.
[3] https://www.medialit.org/reading-room/what-media-literacy-definitionand-more.

- Media Literacy is a twenty-first century approach to education.
- It provides a framework to access, analyze, evaluate, and create messages in a variety of forms – from print to video to the Internet.
- Media literacy builds an understanding of the role of media in society as well as essential skills of inquiry and self-expression necessary for citizens of a democracy.

Information Literacy

Ideas of Information Literacy often appear in relation to the use of organised information sources – such as libraries and databases. Very often they include an element of being a 'citizen' or of 'citizenship'. The UK Chartered Institute of Library and Information Professionals (CLIP) defines Information Literacy as "the ability to think critically and make balanced judgements about any information we find and use. It empowers us as citizens to develop informed views and to engage fully with society."[4]

Computer Literacy

Computer Literacy is less clearly defined and is often broadly viewed as the ability to use 'computers'. Different definitions can stress different aspects of computer use including:

- "understanding the basic processes of computers and technology and being able to use those processes" (Velliaris & Breen, 2016).
- "understanding of computer characteristics capabilities and applications, as well as an ability to implement this knowledge" (Yadollahi, 2015).
- "the comfort level someone has with using computer programs and other applications that are associated with computers"
- "the level of knowledge and skills about information and communication technologies and how to use it in your work and everyday life"

Some definitions of computer literacy are much closer to the CLIP definition of Information Literacy. Overall, definitions range from having the practical skills of keyboard and mouse use, to the ability to code, or use of all forms of Information and Communication Technologies.

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[4] https://www.cilip.org.uk/news/421972/What-is-information-literacy.htm.

Digital Literacy

In 1997 Paul Gilster (Gilster, 1997) defined Digital Literacy as "the ability to both understand and use digitised information". Since then, there have been a wide range of definitions that overtly build on media, computer, and information literacy as well as civic or social engagement. For example, the American Library Association (ALA) defines digital literacy as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills".[5] In the UK, AdvanceHE define Digital Literacies(s) – plural – as a set of "capabilities required to thrive – that is to be an effective and responsible participant – in a digital society".[6]

Combining These Definitions

UNESCO[7] has proposed a combined Media and Information Literacy approach, to which they have added a set of digital skills (see Table 12.1). This framework underpins UNESCO's approach to supporting organisations and countries to provide Media and Information Literacy education. Again, this definition and the supporting documentation focus on citizens "thinking critically and clicking wisely".

Digital Literacy

We take Digital Literacy to include the majority of the components listed by UNESCO as Media Literacy but refined to incorporate digital media and systems. By digital media and systems, we mean the full range of digital devices, platforms and content that citizens encounter. This includes but is not limited to:

- Broadcast TV and Radio – mostly now produced and delivered digitally.
- Streaming platforms – for music, film, TV and other content.
- Web content and platforms of all forms – from static web pages to shopping sites, from newspapers to government services.
- Apps – that provide services and content via devices.
- Games – from mobile game apps to multi-platform block-buster games.

[5] https://literacy.ala.org/digital-literacy.
[6] https://www.advance-he.ac.uk/knowledge-hub/digital-literacies.
[7] https://en.unesco.org/news/media-and-information-literate-citizens-think-critically-click-wisely.

Table 12.1 UNESCO media and information literacy (note alignment of columns is not significant)

Define and articulate information needs	Locate and access information	Assess information	Organize information	Make ethical use of information	Communicate information	Use ICT skills for information processing
Information literacy						
Define and articulate information needs	Locate and access information	Assess information	Organize information	Make ethical use of information	Communicate information	Use ICT skills for information processing
Media literacy						
Understand the role and functions of media, and internet communications companies in democratic societies		Understand the conditions under which media can fulfil their function	Critically evaluate media content in the light of media functions	Engage with media for self-expression and democratic participation	Review skills (including ICTs) needed to produce user-generated content	
Digital literacy						
Use of digital tools	Understand digital identity	Recognize digital rights	Assess AI issues	Improve how to communicate digitally	Manage digital health	Practice digital security and safety

Why such a wide definition?. A contemporary smartphone user might engage with all such systems within the space of a day on that one device. They might slip from news content via X (previously Twitter), to a film clip on Facebook, to booking a health appointment, to playing Wordle in the space of a few minutes. To have the *capabilities required to thrive – that is to be an effective and responsible participant – in a digital society* requires the ability to work with all these media and systems (Table 12.2).

Data Literacy
We take Data Literacy to include the majority of the components listed by UNESCO as Information Literacy but expanded to incorporate the nature of digital media and systems. Information Literacy was defined when most information was well managed and curated by key gatekeepers – from librarians to publishers. Even in the early years of the internet, information remained managed by a more limited list of organisations. The process for creating information – as opposed to news or entertainment – was quite slow and deliberate.

This is no longer the case. Not only is content produced constantly on digital platforms, but the very acts of using platforms generate data and information that is then used by the platforms or others. Though many human and institutional gatekeepers remain, this mass of data and information is often created, collected, processed, and then affects citizens via automation and algorithms. This data economy underpins our contemporary digital society. Unlike other technologies such as print or TV where the content could be varied but was not itself interactive and dynamic. The 'traditional platforms' of print and TV did not in and of themselves monitor nor collect data on users. Nor did they make decisions in and of themselves about content to be delivered. Digital media and systems do work in this dynamic way and data underpins all that activity. Understanding the role of data and information – having Data Literacy – therefore needs to sit alongside understanding how to use digital media and systems. In the same manner that UNESCO placed Media Literacy alongside Information Literacy (Table 12.3).

We have developed this definition of Data Literacy from a range of prior works as well as our own research findings. We have tried to produce a coherent definition pulling in the various strands of these prior works. They do not offer one coherent definition and some focus very heavily on analytical data skills rather than citizenship. Table 12.4 details these sources and our reworking of them into our model can be found in (Yates et al., 2021).

Table 12.2 Digital literacy

Digital literacy						
Ability to effectively use digital media and systems to generate content, communicate and achieve a life citizens value.	Understand the role and functions in democratic societies of digital media and systems and the organisations that own or control them.	Understand the conditions under which digital media and systems can fulfil their social and personal functions.	Ability to critically evaluate the content and behaviour of digital media and systems in the light of their social and personal functions.	Ability to engage with digital media and systems media for self-expression, democratic participation and to achieve a life citizens value.	Understand their rights over digital media and systems as citizens of a digital society.	Understand how to use digital media and systems safely, securely, legally and ethically.

Table 12.3 Data literacy

Data literacy						
Define and articulate role of data and information in a digital society and articulate own data and information needs.	Be able to locate and access data and information they need as citizens of a digital society.	Be able to critically assess the provenance, veracity and reliability data and information.	Understand what data and information digital media and systems collect and the uses they and organisations make of it.	Understand how to manage and use data and information safely, securely, legally and ethically.	Understand their rights over data and information as citizens of a digital society.	Use digital media and system skills for data and information processing, manipulation and communication to achieve a life citizens value.

3   WHY SUPPORT, DEVELOP, OR TEACH CITIZENS' DATA LITERACY?

A simple reason for helping citizens develop data literacy could simply be that it is a good thing in and of itself and therefore worth doing! That is a valid reason. This chapter explores our broader reasoning as to why it is important to develop democratic education or interventions to support data literacy and citizenship. The arguments made here reflect our own take on this question. We hope they provide a case that others might use if they need to argue for supporting citizens to develop data literacy – be that with policy makers, within their organisation, or with communities.

A more cynical position might ask why do we need to teach Data Literacy? If people are happy using digital media and systems and not worried out their data – why do they need to know more? As the North Americans say, "no harm – no foul". Sadly, it is clear there is harm. Even if we leave aside criminality in the form of hacking and online scams, there have been many cases of citizens' data being used in ways that may be harmful to them. The Cambridge Analytica scandal is just one such case that many people – both researchers and the people we interviewed – refer to.

Our research found that Data Literacy knowledge and skills are low in the UK. We also found that many people were uncomfortable with digital media and systems using their data, tracking their activities, and sharing their data with 3rd parties. Such that words such as 'creepy' and 'horrid' were used (Yates et al., 2021; Carmi & Yates, 2023). Of course, not everyone is in the same position, we will shortly talk through our analysis of different 'user types' or 'audiences' for Data Literacy education. This

Table 12.4 Definitions of data literacy

Definition	Source	Type	Focus
"Data literacy defined pro populo"	Crusoe, D. (2016)	Theoretical	Power relationships and control of data
Data literacy	Wolff, A., Gooch, D., Montaner, J. J. C., Rashid, U., & Kortuem, G. (2016)	Literature review and analysis	Use and analysis of data
Data literacy	Deahl, E. (2014)	Literature and case studies	Everyday awareness, use and analysis of data
Data information literacy	Carlson. J, & Johnston, L. (2015)	Empirical qualitative research and case studies	Data literacy for higher education
Data literacy	Mandinach, E. B., & Gummer, E. S. (2013)	Literature review and analysis	Data literacy for higher education managers
Data literacy	Grillenberger, A., & Romeike, R. (2018)	Literature and curriculum analysis	Data literacy for computer science in higher education
Data literacy	Vahey, P., Yarnall, L., Patton, C., Zalles, D., & Swan, K. (2006)	Quasi-experimental study of educational intervention	Data analysis skills development in school classroom setting
Youth data literacy	Williams, S., Deahl, E., Rubel, L., & Lim, V. (2014)	Participatory science project	Data analysis skills development in school classroom setting
Critical data literacy	Tygel, A., & Kirsch, R. (2015)	Theoretical	Critical data literacy for citizens
Racial data literacy	Philip, T. M., Olivares-Pasillas, M. C., & Rocha, J. (2016)	Qualitative case studies	Critical assessment of data analytics and data visualisation school teaching in relation to race
Personal data literacy	Pangrazio, L., & Selwyn, N. (2019)	Theoretical	Personal critical data literacies for citizens
Civic data literacy	Civic Switchboard Guide, (2019)	Guidelines for using civic data	Libraries and support for citizens using civic data
Creative data literacy	D'Ignazio (2017)	Review of case studies	Using creative practice to build data skills

analysis indicates that those with post-18 educations and higher levels of interaction with digital media and systems, have higher overall Data Literacy. However, even these groups can lack key knowledge or skills. So why do we need to address this gap?

We argue that citizens need a level of Data Literacy to function as active citizens in our contemporary digital society. However, our research shows that there is clearly a gap in the knowledge and skills that citizens need to address, both basic awareness and to develop responses. What happens to the data we generate about ourselves, others, family, and our community – how it is used and our rights over it – are fundamental issues for contemporary society. At no point in prior history has the state, institutions or businesses had such easy access to so much information about citizens, workers, or customers. This has developed in a very short space of time – only a few decades – and we are only just coming to grips with some of the implications. These developments raise important questions for democratic societies about how to respond to this change. Especially as much of the power lies with major technology companies. They both design the technologies and conduct much of the data gathering and processing.

In the UK and EU the 2018 General Data Protection Regulation (GDPR) legislation is often presented as an example of international cooperation to address this power imbalance and to give rights to citizens over their data. However, having data rights, understanding them, being able to exercise them and knowing how and where they apply, all depend upon understanding how the data is used in contemporary society. It requires a level of Data Literacy.

As our research has shown, even the most digitally active citizens may not have extensive or comprehensive levels of Data Literacy. Importantly, we have identified education as one of the key variables that determines the levels of Data Literacy that citizens have. We therefore argue that developing citizens data literacy is key to supporting their active participation in healthy contemporary democratic societies.

4   Data Literacy and Citizenship

As we have argued elsewhere, developing Data Literacy and Data Citizenship is about developing the digital capabilities (Nussbaum, 2002; Sen, 2009) of citizens (see Carmi & Yates, 2023).

- What does it mean to be a citizen in today's 'datafied' society?
- Does it mean citizens only need to be able to send email, use social media, purchase things online and know basic management skills for their work?
- Is it the broader capacity to assess and understand how digital media and systems work, are owned, managed, and regulated?

The academic writers Engin Isin and Evelyn Ruppert (2020) argue that being a digital citizen is about the ability to make "digital rights claims". This means having enough understanding to assert political and consumer rights claims over how digital media and systems work, how they use data, for what purposes as well as how they are owned, managed, and regulated.

> … what makes a subject a citizen is the capacity for making rights claims [and] the citizen as subject of power comes into being through acts of making rights claims. *Conventions* are about instituting rights to govern relations between subjects and between subjects and *conventions.* By making rights claims, citizen subjects govern their relations with themselves, with others and with *conventions* (Isin & Ruppert, 2020, p. 39 emphasis added)

Whether we view data and digital citizenship more broadly, as an ability to engage in digital life, or more specifically, as an ability to make rights claims, citizens need to have both Data and Digital Literacy as well as broader critical skills. Basic Data and Digital Literacy skills might include accessing online information, contributing to online debates, or managing privacy settings. The critical skills include digital citizens' abilities to analyse, understand, and respond to the socio-economic dynamics of the digital world and their possible impact on society (e.g. digital inequalities, surveillance). Therefore, digital citizenship might be viewed as an evolving, proactive process of social engagement, negotiations and challenges to the way civic action is enacted in a digital society.

Data is central to the digital society and, as we have argued above, Data Literacy is a converse or complimentary concept to Digital Literacy, that needs to be a key point of analytic focus. It is also central to the performance of citizenship, or the methods through which citizens are subject to the power of platforms. We would argue that there is a widening of the divide and power imbalance between *data subjects (citizens)* and *data processors (big tech)* (Carmi & Yates, 2023).

Data processors, being those who own and manage data subjects' data, can, as a result, capitalise on this widening divide (Hintz et al., 2017). These are largely private 'big tech', Internet service providers and the state. Technology companies hiding their data extraction behind complex, often opaque, and potential deceivingly designed interfaces (Carmi, 2020; Carmi, 2021). It is also the case that the differentiation between citizen data (data from interaction with the state and civic action) and consumer data (our patterns of consumption) is becoming blurred (Cheney-Lippold, 2017; Barassi, 2019; Andrejevic, 2014; McCarthy, 2016; Hargittai & Marwick, 2016).

As we found out in our research, the sense of disempowerment around data, leads to citizens feeling confused and unable to identify, understand or respond to those who are in charge of their data.[4] Our review of the literature reveals a number of studies examining the notion of the 'privacy paradox' (Hargittai & Marwick, 2016) whereby citizens are worried about their data online, but continue to create it nevertheless. It has been found that young people feel they have no choice but to oscillate between their desires for digital participation and online information creation, and fears related to their online privacy. Moreover, there is evidence that through implementation of methods of forced 'digital compliance' (e.g. signing terms and conditions), some citizens decide to embrace the big-data divide as 'the new normal' (Lin et al., 2017).

The big data divide has an impact not only on citizens' self-awareness, but their entire web of interactions within society. Importantly, unlike common beliefs that this divide only applies to people who use the Internet, research suggests that even those who do not use the Internet or specific platforms are also subject to profiling. Data is often collected and distributed by people we know (e.g. a photo taken by a friend shared on social media) and organisations we interact with (e.g. social benefits agencies, municipality election registries). Smartphone users might have information collected when their devices or mobile applications are not in use. Citizens' data can be collected on a range of devices, which might include health apps trackers, smart-home technology or internet-of-things toys. In 2019 it was reported that 14 million users of a UK parenting platform had their personal data collected (without their explicit consent) through sources such as websites, mobile apps, merchandise – and from the hospital bedsides of new mothers. In this way, the big technology companies (*data processors*) who process much of our data hinder and constrain

citizens' ability to exercise their rights as citizens to freedom, autonomy, agency, choice, voluntariness, privacy, and self-determination.

Yet we do not want to paint a picture of citizens of digital and datafied societies as being solely defined by their data, nor absolutely constrained by the functioning of platforms or algorithms. We therefore see it as important that the conceptualisation of Data Literacy includes the capacity for citizens to question, assess, challenge, and make rights claims within a datafied society.

5   Democratic Education and Data Citizenship

We argue that Digital and Data Literacy needing to be more than "basic digital skills" that turn people into better consumers or workers. There is a need to combine these with broader critical thinking and knowledge about the digital eco-systems in which citizens are now effectively forced to operate in. We have therefore brought the ideas of "democratic education" (Dewey, 1930; Freire, 1970/1996) into our model. Democratic education aims to equip citizens with skills and knowledge which enable them to exercise their citizenship. Democratic educators' objective is to empower citizens to critically examine their positions within the existing power structures in society, and to develop skills and understanding to take an active stand in the process of their individual and collective self-determination.

The parallels between teaching critical consciousness and Data Literacy education have been outlined by Tygel and Kirsch (2015) who proposed that data-centred democratic education should aim to enhance citizens' critical comprehension of data realities and encourage them to question the existing data-society norms. To achieve critical consciousness in the context of Data Literacy, Wolff et al. (2016) argue that "[data] learning experiences should be responsive to cultural differences that might affect an individual learner's view of the world".

This guide therefore seeks to provide you with ideas and resources focused on this issue of **democratic education for data citizenship**. The goal is to provide advice on how to support citizens to think critically and carefully about what currently happens to their data and the data produced by their community, but also to think critically about what should happen to that data, what they think is right and just regarding the use and sharing of data in contemporary society. Therefore, it does not focus on basic digital and data skills, nor on complex data analytic skills, but rather

on the key issues of *data thinking* and *data participation* that other training interventions do not address.

Our definition of Data Literacy is much broader than basic skills and includes a focus on critical thinking that cuts across both data management and analytic skills. Looking at our definition in Table 3 and the ideas in these studies, we have broken Data Literacy down into specific activities (see Table 12.5) and grouped these into three everyday activities:

- **"Data Doing"** covers many of the practical data management and analytic aspects of data literacy.
- **"Data Thinking"** relates to both practical and critical use of data to understand, problem solve and to communicate with data.
- **"Data Participation"** covers activities that involve an active response to being a citizen in a datafied society. In particular, the critical

Table 12.5 Elements of data literacy and citizenship

Aspects	Data doing	Data thinking	Data participation
Accessing	X		
Assessing	X		
Interpretation	X		
Data creation	X		
Data citation	X		
Data management	X		
Ethical use	X		
Data deletion	X		
Data visualization and manipulation	X	X	
Understanding of data collection	X	X	
Problem-solving using data		X	
Communicating with data		X	
Critical data analysis (e.g. data bias, cultural contexts)		X	
Data safety (e.g. skills to manage and control 'digital traces')		X	
Understanding privacy		X	
Awareness of data protection rights		X	X
Understanding data society		X	X
Participating in society using data			X
Engagement with data society debates			X
Data activism			X
Supporting others with their data literacy			X

assessment of the use of data, skills to assess, resist, and undertake activism to change and negotiate both technologies and systems of power in a datafied society. Importantly, we believe that this must include working with others, groups and communities and may involve the collection, repurposing, and use of data in such activism.

A comprehensive approach to Data Literacy education and training would cover all these activities. Our focus on democratic education sets up a requirement to assess these practical activities in relation to issues of politics, power, and social context. It is this critical awareness, critical thinking, and active citizenship element that we will focus on in this guide.

6   Seven Principles for Developing Citizens Data Literacy

From our research (Carmi & Yates 2020; Carmi et al. 2020; Yates et al., 2021) we developed seven principles for developing interventions to support citizens Data Literacy. These are starting points for thinking about interventions. The goal of interventions has to be one of empowering digital citizens with good Data Literacy.

Any educational intervention, awareness raising, or community engagement must:

1. **Ensure citizens feel more empowered** and have practical and alternative routes to enact that empowerment.

   - Do not just make people scared of using digital media and systems – help them feel empowered to deal with them.

2. **Consider the design and practical challenges citizens face** in managing and controlling the data they share or "give off" whilst also being actively involved with others via the plethora of platforms in our digital society.

   - Citizens cannot just "stop using Facebook" – help them manage the risks and benefits.

3. **Make clear to citizens their rights – as citizens not just consumers –** to make claims in regard to data use, sharing and trading and also of digital systems and platforms.

- Remind them that they have rights under GDPR and that they can complain, flag up social media content, disable adverts on systems, etc.

4. **'Meet citizens where they are'** in terms of their digital and social experience and context.

   - Know your audience.

5. **Address the challenge that those adults most in need of support are very likely outside formal educational settings.**

   - People in education or who have had post-18 education are the least in need. Though everyone needs to improve their Data Literacy.

6. **Support skills development but must be more than skills**, encompassing key elements of Data Participation.

   - Do not just focus on skills – in fact there is lots of help out there for skills – it is the critical awareness and proactive citizenship that are missing in most training and support.

7. **Seek to provide deep critical consciousness the power relationships in our datafied society** and support them to exercise their right to challenge this imbalance and demand change.

6.1   *Audiences and Resources*

We would argue that there are two key areas to consider in putting together an intervention to support Data Literacy. These are your audience, and given that, the selection of appropriate resources. There is little point providing an academic reading list to people who have low levels of digital skills. Similarly, there is little point undertaking an activity on 'what is data' with a set of computing experts. That said, we would caution not to assume things about your audience. There tends to be an assumption that "digital natives" know everything, whereas in our research, we find many young people with low Data Literacy (Yates et al., 2021). We also found older people, with low digital skills, applying good Media Literacy ideas about bias to social media. Social context is also important. Younger people tend to use a different mix of social media than older people. Some communities or even family groups prefer one medium over another. For

example, one group might use a closed system like WhatsApp, whereas others may use more open platforms like Facebook. We also find that individuals and groups have 'go to people' for help with digital, what we call *networks of literacy* (Yates & Carmi, 2022), and these 'go to people' might be key to driving change in a community's approach to digital. We will explore further how to assess and understand your audience in a moment.

In terms of resources, you need to think about the types of content your audience will engage with, in regard to both depth and relevance. Complex arguments about the legal use of scraped social media data may be of interest to activists in a protest group, but not people just getting to grips with using a smart phone. We have provided a list of potential resources on our project web site.[8] These resources might be journalism, academic research, or the outputs of activist groups. We believe that what is missing are developed approaches to move people from basic digital and data skills, through to the broader issues of digital and data justice, and citizenship. These are mostly discussed in academic and some media circles.

Audience

So how to assess and understand your audience? In our Me and My Big Data project we developed a set of 'personas' for different types of 'users' of digital media and systems.[9] We would hope that these might work well as starting points for others to reflect on the circumstances of audiences they are designing for. These are very broad-brush descriptions and there are of course many social, cultural, and personal variations among these groups. We would strongly advise working with intended audiences to collect information and insight on them through individual or group conversations, or potentially some more quantitative information through short surveys. The key questions about your audience include:

- What are their levels of digital skill and competence?
- What are the main platforms they use?
- How actively do they use different platforms? (e.g. do they post or scroll?)

- Do they use digital platforms in their work or study as well as everyday life?
- Do they already have a good knowledge of how data are used by platforms?
- Do they have good broadcast media literacy?
- Who do they rely on for help with platforms and data?
- What concerns do they have about data and how platforms use it?
- Are they engaged in digital or data activism or participation?

Getting answers to these kinds of questions will allow you to better select resources and plan activities for your participants.

Where to Find Resources

Digital technologies, the platforms we use, and the ways we use them, are changing all the time. As are the concerns that citizens have about their use of these technologies. Our relationships with them and through them, to friends and family, are also changing. Choosing the right resources for a target audience therefore needs to balance their level of knowledge, topics of concern and the goals of educational or training activity. It is clear from our research that short video content, especially YouTube, is one of the key 'go to' sources of help and support for all types of users. For those with higher levels of digital and data literacy, we found media content such as news and documentaries and even films were drawn on to help understand platforms and the data economy.

There are three types of resources our respondents, other academic colleagues and we have found during our research:

- Journalism and media coverage.
- The work of Activist groups.
- Academic research and findings.

Very often these three groups work together. Journalism and news media coverage often provides quite digestible materials for discussions of the issues of Digital and Data Literacy. They range from YouTube videos to Ted Talks and from full blown documentaries to short media reports. Though some of these easily stand on their own as items worth watching, nearly all will need an appropriate educational or training 'wrapper' around them. This might consist of briefing notes on key issues, follow up discussions or self-assessed questions. Such resources will of course constantly

increase and change as new issues, new journalism and new media content develops. We suggest that anyone working to deliver Digital and Data Literacy development and training should maintain a list of such useful content. Activists and key organisations, web sites and major 3rd sector organisations, governments and activist groups maintain websites that seek to explains issues, provide training and development, or contain their own substantial education resources. OfCom and DCMS are the UK media regulators and have obligations to develop citizens Digital and Media Literacies. As noted above, UNESCO takes a similar role for the United Nations.

There is a great deal of academic, activist, and long form journalism that covers issues of digital and data literacy. We have listed below a set of books that we think are either key texts or provide an accessible route into key issues (alphabetic order):

- Arthur, C. (2021). Social Warming: The Dangerous and Polarising Effects of Social Media. Simon and Schuster.
- Athique, A. (2013). Digital media and society: An introduction. John Wiley & Sons.
- Baym, N. K. (2015). Personal connections in the digital age. John Wiley & Sons.
- Carmi, E. (2020). Media distortions: Understanding the power behind spam, noise, and other deviant media. Peter Lang International Academic Publishers.
- Cheney-Lippold, J. (2017). We are data. New York University Press.
- D'ignazio, C., & Klein, L. F. (2020). Data feminism. MIT press.
- Doss, A. F. (2020). Cyber Privacy: Who Has Your Data and Why You Should Care. BenBella Books.
- Eubanks, V. (2018). Automating inequality: How high-tech tools profile, police, and punish the poor. St. Martin's Press.
- Highfield, T. (2017). Social media and everyday politics. John Wiley & Sons.
- Isin, E., & Ruppert, E. (2020). Being digital citizens. Rowman & Littlefield Publishers.
- Kearns, M., & Roth, A. (2019). The ethical algorithm: The science of socially aware algorithm design. Oxford University Press.
- Kennedy, H. (2016). Post, mine, repeat: Social media data mining becomes ordinary. London: Palgrave Macmillan.
- Lupton, D. (2016). The quantified self. John Wiley & Sons.

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7   Conclusion

We have argued here that Data Literacy is key to digital citizenship. However, our research shows that levels of Data Literacy are low for many groups in the UK population, and we would assume also most other nations. In section six of this chapter, we laid out our seven principles for building and developing Data Literacy and Data Citizenship interventions. At the core of such interventions needs to be a deep understanding of target audiences and the selection of appropriate resources to support the intervention. As we noted above, when initial designing our "Me and My Big Data Project" – in the months before the Cambridge Analytica scandal broke – we had hoped to be able to recommend a set of specific educational materials and topics that would work of all citizens. Our surveys and focus groups made clear that internet users (and those offline) have varied understandings and starting points on their Data Literacy and Citizenship journeys. Interventions, therefore, need to be tailored to that starting point. Though we are very clear that such interventions need to include skills – but be much more than skills. They need to empower data subjects – citizens – to make and drive forward digital rights claims against those who current process and (ab)use our data.

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