Telematics and Informatics xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Telematics and Informatics

journal homepage: www.elsevier.com/locate/tele

Digital access, choice and agency in remote Sarawak

Christine Horn[a,*], Ellie Rennie[b]

[a] Centre for Urban Transitions, Swinburne University of Technology, Melbourne, Unit 10, 109 Flinders Street, Thornbury, 3071 VIC, Australia
[b] Digital Ethnography Research Centre, RMIT University, Melbourne, Australia

ARTICLE INFO

Keywords:
Digital divide
Digital inequalities
Digital repertoires
Remote internet use
Southeast Asia
Digital media

ABSTRACT

Internet use and access to digital devices continues to increase even in remote regions around the world, but users do not participate equally or engage in the same practices online. This leads to inequalities in the outcomes different groups of users can generate as a result of their online practices. Drawing from recent literature on digital divides and using a theoretical framework focused on user choice and agency, we present data from a study of internet and device use in remote villages in Sarawak, a state of Malaysia on the island of Borneo. These villages lack most basic infrastructure such as paved roads or grid electricity, but some have mobile phone and mobile internet access installed under Malaysia's Universal Service Provision. We discuss qualitative and quantitative data collected between 2015 and 2017 to point to the opportunities as well as obstacles users in remote communities encounter in their engagements with digital devices and the internet. We argue that while remote areas seem to lag behind urban areas in terms of users' internet skills and practices, people choose to engage with these technologies in ways that are appropriate to their needs and to the local low-bandwidth environment. To enable these communities to tap into additional potential benefits of internet use, however, faster and more reliable access is a prerequisite.

1. Introduction

In 2017 the Malaysian state of Sarawak announced plans to dramatically improve internet connectivity and speeds, including for those living in remote villages. The policy aspiration raises the question of whether improved internet access will reduce hardships associated with living in these remote areas, and if so, how this will occur. In this paper, we explore what constitutes effective internet use in the current context of limited internet access in some of Sarawak's remotest villages, and ask what this might tell us about possible outcomes in better access conditions. We show that understanding the outcomes of internet use requires local investigation of the choices people make. Examining use in conditions of limited access – limitations caused by either access or affordability – provides only a partial picture of what is occurring. Investigating the choices associated with use, on the other hand, reveals current and possible outcomes, including where digital inequalities are the result of existing knowledge and capacities; where they may be the product of community norms; and where they relate to deprivation of other resources and infrastructures.

The research took place in 11 remote locations in the Malaysian state of Sarawak. The Baram region is characterised by dense forests and small villages connected by rivers and forestry roads. Distance to markets and high transportation costs restrict participation in plantation crops, favouring subsistence farming and local trade. Households in this region are underserved when it comes to communications infrastructure despite previous government programs. In real terms this means that few can receive internet at home, forcing people to seek out connectivity by standing near a cell tower or Wi-Fi hotspot, and in some cases requiring travel to

* Corresponding author.
E-mail addresses: chorn@swin.edu.au (C. Horn), ellie.rennie@rmit.edu.au (E. Rennie).

https://doi.org/10.1016/j.tele.2018.06.006
Received 4 May 2018; Received in revised form 22 June 2018; Accepted 25 June 2018

other towns or villages.

Nonetheless, many people do use the internet when and where they can. We found that internet use in the Baram is mostly focused on social media. On the surface, this finding would seem to suggest that those with few resources are the least likely to experience tangible outcomes from online use, and that lack of skills may result in a narrow set of online engagements. However, on closer observation, we found that social media is used for multiple purposes, including coordination of transport and other resource-sharing activities, reducing associated costs. Rather than indicating that those from lower socio-economic status are restricted in how they use the internet, our evidence shows that social media platforms are creating efficiencies in local markets as well as maintaining cultural activities and priorities. While internet banking and e-government offer seemingly more direct benefits (including access to welfare payments), these were used by a low proportion of people, possibly due to the dominance of cash transactions in the absence of digital infrastructure. The findings suggest that the region may experience significant benefits from improved internet, although some skills training may be required for theses outcomes to be realised.

2. The digital divide

The concept of the digital divide was originally conceived as a way of referring to groups or populations with access to the internet and personal computers compared to those without (Gunkel, 2003; Van Dijk, 2006). The use versus non-use comparison was employed as an indicator of national competitiveness in the global knowledge economy, as well as in the development industry, where it was hoped that access to information could alleviate other social inequalities either through education or participation in new markets (Evers, 2003; Mustapha and Abdullah, 2004; Nor et al., 2011).

As the digital divide field evolved it became apparent that even where equal levels of internet access and speeds were achieved, not all groups experienced the full benefits of internet use equally. Digital inequality research began to pay close attention to what different groups did online, and to how differences in skills correlated to different uses (Hargittai and Jennrich, 2016; Pearce and Rice, 2013; van Deursen and Helsper, 2015; Van Deursen and Van Dijk, 2014; Van Dijk and Hacker, 2003). These studies linked internet use to socio-economic status. Van Dijk's *uses gap hypothesis* built on the *knowledge gap hypothesis* of the 1970s, in which those with higher education and other resources were found to be more likely to use the media for news and other capital-enhancing media consumption as opposed to entertainment. In Van Dijk's theory, inequality in internet uses is of greater consequence than inequalities in media access as internet use can be for various types of activities – "differential uses and activities in all spheres of daily life, not just the perception and cognition of mass media" (Van Deursen and Van Dijk, 2014: 509). Following the uses gap hypothesis, it can be assumed that as more and more activities move online, including government and social services, those left out will experience increasing disadvantage (Thomas et al., 2016).

Studies in developed countries refute the notion that access alone will lead to greater opportunity, instead suggesting that those with existing social and economic capital will benefit the most from online opportunities (known as the Matthew Effect). The highly educated are more likely to use the internet for capital-enhancing activities such as online learning or job searching (Helsper and Galácz, 2009; Zillien and Hargittai, 2009), while those in lower socio-economic classes tend to use the internet differently, with a narrower range of activities that do not require an extensive skillset (van Deursen and Helsper, 2015; Wei, 2012). Even within social media platforms different uses have been observed. For instance, Correa's study of young people in Chile found that those with greater privilege tend to use social media for information gathering and mobilising activities (Correa, 2016).

However, these same studies show that some groups defy prediction. In such cases, it might be that skills programs are assisting people to make effective use of the internet regardless of their socio-economic status (van Deursen and Helsper, 2015). It is also possible that some groups might experience benefits because their internet use is influenced by particular community norms, or cultural or communicative motivations that are not readily observable through statistical analysis of datasets.

3. Digital choice and agency

Digital divide studies that use large survey datasets are useful for showing broad trends in internet adoption and use across different variables such as class, education, age and others. These studies do not tell us why these patterns occur, or where some patterns might relate to certain factors in a person or group's context. In addition, categorizing practices according to whether they are productive or not can be problematic as the benefits associated with particular uses are highly variable from one context to another. Internet practices can be more or less productive depending on how they are applied, as users combine personal and professional activities while using the same platforms and the same devices. Development communication scholars use the term "effective use" (Donner, 2015; Gurstein, 2003) to refer to the use of internet to overcome limitations that are often specific to the context, community or environment.

Ellen Helsper acknowledges the limits of research approaches where the unit of analysis is the individual (as represented within datasets). She uses relative deprivation theory to posit that people make cognitive and affective evaluations of their disadvantage, including comparing themselves with others. Digital inclusion therefore can involve norms and behaviours that change from one group to the next (Helsper, 2017).

One framework for considering these dimensions of digital inequality is Amartya Sen's capabilities approach (Sen, 1983). Sen uses the word *functionings* to describe what a person may value doing and being, and *capabilities* as the combination of functionings that are feasible for her to achieve. For Sen, development is not determined by access to resources alone, rather, it needs to be understood as an individual's agency within her particular context (Nussbaum and Sen, 1993). Resources are important, insofar as they impact on what an individual or group is able to do. But there are other systemic factors that influence what is achieved, such as living in a