Dimensions of the Digital Divide

Marcus Leaning

and

Udo Averweg

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INTRODUCTION

The digital divide is a term used to describe a difference in the use of digital (including social) media between and within populations. It concerns the extent to which engagement with digital media causes and is caused by varying demographic factors. The term was first used in 1999 (van Dijk, 2017) though an understanding that there existed a gulf between those able to use and access information through digital media and those who could not, existed since the mid-1990s. The issue received considerable attention in the early to mid-2000s (for example, by the Organization for Economic Cooperation and Development (OECD)) yet in contemporary times the term seems to have drifted out of the public consciousness. However, there are still large differentials between regions of the world in terms of rates of access to digital media. There are also notable differences between communities in developed countries in terms of what forms of access people have and what they are able to do with this access.

As understanding of the divide has progressed conceptualizing the various reasons people are not able to avail themselves of the potency of computers and the internet has become more sophisticated. In this article, the authors contend that the idea of the digital divide can be understood to operate in a range of different 'dimensions'. Previous work on the topic has identified different historically situated 'orders' of the digital divide and in some ways the dimensions under consideration here match these. However, such accounts tend to locate the forms of divide as occurring sequentially and that the latest form of divide presents the most prescient problems. In contrast the authors contend that the differing forms are still present and that the problem is a multi-faceted one which requires a multi-level approach to address. In this chapter the authors consider the three main dimensions that impact upon a person's ability to make use of digital media.

BACKGROUND

In its simplest terms the digital divide refers to a form of social stratification that is simultaneously enacted and furthered by an individual's ability to utilize digital media to render their own self-interest (Leaning, 2017a). That is, our access to and use of digital media in part determines our social opportunities but is simultaneously related and determined by forms of social inequality (Ragnedda, & Mu, 2013). It impacts an individual's ability to use digital media to assist them in their lives but also impacts upon their engagement with political

processes. Accordingly, the digital divide is both a problem for individual people and also for the operation of democracy and citizenship.

In this article the authors first consider the physical (access to the equipment to connect) and material (ability to afford the expense of connection) digital divide and rates of access across and within a number of countries. Second, the authors then look to the issues of training and education that impact upon people's ability to access computing technology. Third, the authors look at what people are actually doing online and will note that demographic differences between people are often also manifest in their forms of behavior and ability to leverage digital communications to their advantage.

The authors term these different barriers as different dimensions to highlight their interrelatedness and concurrency. It is felt that to refer to the problems as barriers or orders implies that the issues occur sequentially. While they were identified sequentially, treating them in this manner means that the complexity of the issues and the interrelatedness of the three issues may not be fully appreciated. Instead the authors refer to the issues as dimensions of a complex problem. The dimensions the authors identify here operate in concert and thus cannot be addressed in a piece-meal or singular fashion.

FOCUS OF THE ARTICLE

This article will look at different aspects of the digital divide. The article is structured so that the broad themes (different dimensions) cover the following aspects, as reflected in Figure 1:

- physical and material barriers;
- training and educational barriers; and
- participation divide issues and barriers.

Figure 1. Dimensions of the digital divide in contemporary society

The authors now explore and discuss these each of these different dimensions in the hope that readers may have their awareness and understanding of these digital divide topics strengthened.

Physical and material barriers

There are now high levels of access to the internet in most developed countries and indeed across other regions of the world. For example, in North America and the Caribbean the average access rate is 76.2%, in Europe it is 80.2%, in South America it is 65.3%, across Asia and the Middle East access is 47.0%, in Europe it is 80.2%, in Australia and Oceania it is 69.6%, while in Africa it is as low as 47.0% (Leaning, 2017b). There are, however, very significant disparities of access and many countries lag far behind the most connected regions: while Australia has nearly 85.0% of its population online, only 7.0% of Toga's population has the same access. It must be noted, however, that for many access to the internet comes not through a connected computer but through a mobile device with an internet subscription. Such practices further complicate the picture as in many parts of the world users may possess multiple subscriptions to take advantage of cheaper rates for certain actions.

Furthermore, within countries there are further divides, these replicate and indeed exacerbate other forms of social inequality. Forms of division such as gender (Cooper, 2006; DiMaggio,

Hargittai, Neuman, & Robinson, 2001; Dixon, Correa, Straubhaar, Covarrubias, D., Spence, & Rojas, 2014), educational level (van Dijk, & Hacker, 2003), ethnicity and race (Hoffman, Novak, & Schlosser, 2001; Jackson, Zhao, Kolenic III, Fitzgerald, Harold, & Von Eye, 2008), language (Gurstein, 2003; Mallikarjun, 2004), social class and financial standing (Clayton, & Macdonald, 2013), age (Cresci, Yarandi, & Morrell, 2010), sub-national (Chen & Wellman, 2004) and intra-national regions (Vicente, & López, 2011) have been considered as being important in determining an individual's ability to access computers and internet technology. Such lack of access for members of these groups often results in inequality being further entrenched. Access to the internet is both restricted by various forms of social inequality but also exacerbates and contributes to such inequality as the possible benefits of digital media and denied.

Attempts to deal with these problems run into multiple difficulties. van Dijk's 2005 study determines that a user's motivation may prove to be a barrier that exists prior to access. Of those not online, a small percentage are in that position as they lack the motivation to be online – they are 'want nots' as opposed to 'have nots' and the reasons for not wishing to be online are complex. This may be because of a fear or anxiety, a lack of time, not seeing the value of access, fears over the effects of computing or simply a disinterest in computers. One needs to be cautious about saying such beliefs are problems, however, and there may be many legitimate reasons for not wanting to be online. Once the barrier of motivation is surpassed, the key barrier facing users has been understood to be one of access.

A number of academics (van Dijk, & van Deursen, 2014; Warschauer, 2004) have noted that the issue of access to computers and the internet forms is more complicated than the issue of having direct physical access. van Dijk (2005) and Dijk & van Deursen (2014) note access is comprised of two separate aspects: physical access – which consists of the direct contact with an internet enabled computer – and material access – the wealth to be able to afford the expenses of being online such as broadband subscriptions, costs of various services and 'apps' and subscriptions to services. If one considers the use of mobile devices in developing countries, a number of services also require the user to have credit cards and other financial tools to avail themselves of access - barriers that prevent those of limited wealth from engaging. While many may have physical access through using a computer, through work or in cybercafes or other locations or even possessing one material access proves a more difficult barrier to overcome as it is linked to financial inequality. Warschauer (2004) notes the complexity of successful computer usage "access to ICT is embedded in a complex array of factors encompassing physical, digital, human, and social resources and relationships".

During the late 1990s and much of the early 2000s the issue of the digital divide received attention at the highest of governmental, non-governmental, corporate and charitable levels (Klein, 2004) as well as extensive academic interest (Norris, 2001). Solving the problem of the digital divide became a significant area of domestic and international development activity and consumed large amounts of funding. Many of the solutions proffered involved the greater deployment of technology allowing individuals who were not connected the opportunity to become connected. While in developed countries the issues of physical and material access have been ameliorated to a large degree, they still present significant issues to people in the developing world and are a very current problem.

Training and educational barriers

Significant effort was put into addressing physical and material barriers during the early 2000s. Though there were a few instances, such as Costa Rica, where direct state investment was used

successfully to provision digital service, in most cases the approach to provision has primarily been through the extension of commercial services be they commercial broadband or mobile services. However, it soon became evident that access alone was not the entire solution and the simplistic binary nature of the divide began to be questioned. This resulted in more sophisticated models being developed to account for the digital divide.

The new models conceptualized the digital divide not in binary terms but instead saw a spectrum of ability to access and use of networked computers (van Dijk, & Hacker, 2003; Warschauer, 2002, 2004). In such accounts, though access was still a barrier, other factors became increasingly recognized as preventing full engagement with digital media (Hargittai, 2002) and Warschauer's (2004) critique that access was part of a complex range of relationships and social factors was developed further by a number of authors. The most significant problem identified in these accounts was the lack of skills in using computers and internet technologies and this soon became the focus of attention in efforts to address the divide.

A number of new models of skilled usage were proposed to account for differences in participation (Barclay, & Duggan, 2008; van Dijk, 2005). These models determined a deficit in skills as being central to restricting people availing themselves of the benefits of digital media in terms of activities such as economic activity (König, Lorenz Graf-Vlachy, & Mammen, 2016), business (Arendt, 2008), health (Norman, & Skinner, 2006) and political engagement (Morris, & Morris, 2013).

Actual skills which need to be improved

van Dijk (2005; van Dijk & van Deursen, 2014) advanced the approach further and prepared exhaustive methods for determining the actual skills that needed to be improved so that the divide could be addressed. van Dijk makes use of a model of capital - initially proposed in the work of French sociologist Pierre Bourdieu (Bourdieu argued that social inequality was not simply a matter of not having enough money. Rather he identified three forms of capital (financial, social and cultural) that facilitated social stratification. To these three, the Dutch critic Cees J Hamelink (2000) proposed that as the Information Age progresses, a fourth form of capital must be added, that of information skills as this assists a person's ability to progress in society).

van Dijk & van Deuersen (2014) develop this approach and offer a six-part model of the skills required by individuals to bridge the divide. This model has proven significantly influential in developing numerous programs to equip students with the skills for using digital media in contemporary times and it is worth considering the model in some detail. Van Dijk & van Deursen contend that users need two new sets of skills specific to the digital age:

- *operational skills* – the practical know how to engage with digital media; and
- *formal skills* – the technical practices for using hyper media.

Van Djik then identifies four further content related skills:

- *information skills* – the basic skills of handling information;
- *communication skills* - being able to communicate on the internet;
- *creative skills* - for digital media content production; and
- *strategic skills* – to use one's creative and information skills in a useful manner.

However, while van Dijk & van Deursen's model presents a useful tool for evaluating and developing educational practices for addressing the second dimension of the digital divide he does not advance the nature of the critical approach to information that is developed. Though there is some very brief mention of evaluating information, the proposed model does not

- incorporate any real consideration of how texts themselves should be considered;
- consider the ways in which information that is mediated through a variety of sources and often relayed through different social media lens and channels; and
- explore how a user's data is used by social media platforms and other organisations.

Thus the skills identified by van Dijk & van Deursen and incorporated into many models, also need development and updating to address more recent activities such as the use of individuals social media data profiles. One potential option to address this is the development of a new set of competencies broadly referred to as Media and Information literacy. This literacy incorporates a more critical aspect and utilizes some of the critical methods that have been present in media education for some years but not previously applied to information resources.

A further concern with the information-intensive model developed by van Dijk is that while some attention is paid to the creation of digital media content in the model, this is rather limited in its understanding of the nature of participatory culture and the differing levels of engagement with digital media by different communities.

Participation divide issues and barriers

The development of extensive forms of training provision and skilling practices is understood to have addressed the problems identified in the second dimension of the digital divide. Computing and information skills became an accepted part of the educational curricula for students of all ages in many countries. Moreover, the growing acceptance that people regularly need to update their skills in the workplace and the emergence of the idea of lifelong learning resulted in numerous courses for adults outside of traditional educational spaces. Libraries and similar venues became recognized as places to equip people with the necessary skills to use digital media.

Alongside these changes in how education was understood, during the mid-2000s there was also a range of technological developments (such as the development and proliferation of mobile devices and the emergence of web 2.0 and social media platforms). There were also other developments and systems which afforded users a greater opportunity to produce and disseminate their own content.

The ability to perform such actions was investigated by academic researchers with one branch of research considering the demographic characteristics of those who were producing and sharing material. This area was expressly concerned with the issue of whether (if access and training were equal) an individual's propensity to engage in the productive aspects of social media is adversely affected by 'real world' material, cultural and non-technical educational advantages – are extant inequalities reduced or exacerbated by an individual's ability to participate? This approach was specifically concerned with whether social inequality can be addressed and reduced through digital media, whether social media simply reflects extant social inequalities or whether media further worsens existing problems.

However, establishing a direct link between markers of social inequality and a propensity to engage with social media and participatory culture is difficult. Micheli (2015) finds no

correlation between the parental employment status of users and their proclivity to engage with social media. However, a link is noted between particular activities – such as information seeking - which contributes to the building of social capital and the parental social class. Moreover, engaging in social media is a varied activity ranging from a largely consumptive activity through to a highly productive one in which users create content – social media can be and is put to many different uses in people's lives (Lutz, & Hoffmann, 2014). Furthermore, Blank (2013) and Blank & Reisdorf (2012) note that content production is not a single activity but incorporates many different practices, ranging from posts on social networks, creating written texts, static and video texts, acts of citizen journalism and editing, and repurposing other's content.

The relationship of social inequality and the propensity to participate is complex. Once issues of access and training are addressed, a user's direct ability to use social media and the amount of use of social media usage does not seem affected by the status or forms of social disadvantage their users endure. Indeed, in some instances those from disadvantaged backgrounds have a greater degree of participation than those from a non-disadvantaged social milieu. Blank (2013) and Hoffmann, Lutz & Meckel (2015) both noted that a larger proportion of time is spent on social media by those from low socio-economic backgrounds than those from more wealthier groups. However, what forms of social media are engaged in do seem differentiated by levels of educational attainment and parental social class (in the case of younger users).

Brake (2014), in drawing upon a data set from Oxford University and using a broad range of literature, notes how activities of a more creative nature such as blogging, creating content on Wikipedia or forms of citizen journalism are activities engaged in more by those of higher economic status than those of a lower one. Similarly Hargittai & Jennrich (2016) and Hargittai & Walejko (2016) note how socio-economic status is linked to the production of creative content. Correa (2016) notes no difference in the amount of social media use between members with different educational levels when the use is for social purposes but does identify a difference between users when the task is searching for information. Thus it appears there are particular productive activities that are performed more by people of a higher socio-economic group than those from lower socio-economic groups.

While certain proponents of digital and participatory culture contend that use of any social media builds communication skills and confidence (Jenkins, 2006), it appears there are distinct activities that seem to be performed by particular groups. Some of these activities, such as searching for information, using social media for instrumentally career-focused networking and building personal brands, are correlated with users of higher economic standing and other forms of privilege. However, it is difficult to determine the direction of travel – do socially advantaged groups use social media because they are advantaged or are they advantaged because they use social media in this way? A number of studies (see, for example, Radovanović Hogan, & Lalić, 2015) indicate that the social status impacts upon the way in which social media is used. The determination of which social media practices a user engages with appeal is, to a degree, determined by the level of social advantage a person has. Social media usage is a consequence of prior existing social factors rather than a mitigating factor to them.

SOLUTIONS AND RECOMMENDATIONS

The various dimensions of the digital divide pose a challenging problem. Initial efforts were made to alleviate the disadvantages faced by certain groups and populations which would exclude them from obtaining the advantages of access to digital media. The recognition that education and training were a further requirement to address the issue added a further aspect to the problem and also refocused efforts away from the physical and material problems onto human and social factors. The targeted educational practices of the various digital literacy programmes developed to address the skills divides are still very current issues.

A raft of new initiatives are being developed by international agencies (such as UNESCO) to broaden the training beyond the primarily technical and instructive methods into more nuanced, critical and sophisticated approaches. These new approaches seek to expand training beyond the ideas of how to use communicative technology into challenging the problems of 'Fake News' and propaganda.

The growth of social media also posed questions about how socially disadvantaged groups used different forms of social media and engaged in different practices. This aspect of the digital divide is significantly problematic as research seems to indicate that the expansion of the popularity of social media has resulted in it actually becoming a new space in which extant disadvantage can be enacted. Accordingly, the provision of access to and skilled use of digital media technology and social media may not be a means to alleviate social disadvantage but a new channel by which such disadvantage is continued.

The provision of services, delivery of training and even developing the adoption of specific practices may have side-effects to the intended alleviation of disadvantage and instead social media becomes a further arena through which social inequality is enacted. The provision of such technology should not be seen as a means to alleviate inequality but may indeed be a new means by which such inequality is enacted, facilitated and accelerated (Leaning, 2009).

Accordingly, how one understands the digital divide may be understood not as one of multiple barriers to overcome but rather as one of a social problem of which there are multiple dimensions.

FUTURE RESEARCH DIRECTIONS

To advance understanding of the digital divide, the authors advocate that future research be directed towards a greater understanding of how existing social disadvantages are enacted through social media - explicitly through the differences in use by differing populations and how certain practices can assist in ameliorating social disadvantage. Such digital divide research should dovetail with the approaches currently undertaken in OECD countries – see www.oecd-ilibrary.org

CONCLUSION

The three main dimensions that the digital divide can be understood to operate in were articulated so that the associated prescient problems may soon gain resolution. The authors have shown that in contemporary society the digital divide is a multi-faceted problem which requires a multi-level approach to address the dimensional issues raised.

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KEY TERMS AND DEFINITIONS

1st dimension divides: the physical and material barriers to participation.

2nd dimension barriers: the educational and training barriers to participation.

3rd dimension barriers: the differences in levels of participation.

Critical information literacy: the higher level skills and understanding that result in a person being able to make use of digital media to further their own interests.

Digital participation: the idea that full engagement with digital opportunities assists in furthering one's self interest.

Information and information literacy: the skills needed to successfully use computing technology.

Social stratification: the way in which a society is organized so that opportunities and benefits are more available to certain members of a society than others.