

Views of Digital Divide: A Literature Review

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Abstract

The term ‘digital divide’ was introduced in the mid-1990s and has become popular as an area of interdisciplinary concern. The term has received much attention from many researchers and policy makers. However it remains an important object of public policy debate that encompasses social, economic and political issues which affects humanity and the universe at large. ‘Digital divide’ may result in ‘knowledge divide’ or ‘information divide’ which reflects the level of knowledge and information about the universe and one’s immediate environment as well as its protection. Lack of such knowledge and information may also have specific implications for the socio-economic development in different communities. This paper reviews the literature on the digital divide with regard to researchers’ different views and perspectives of the concept. The literature reviewed in this paper includes journal articles and conference papers published between 2000 and 2014 from various areas, namely information technology and information science, social science and education, and economics and management science. It is clear from the ‘review’ that the digital divide is viewed and perceived differently by the researchers. The different views and perspectives of the digital divide are influenced by a number of factors such as the researcher’s field of study, how the researcher understands the concept digital divide, and problems which the researcher intends to solve.

Keywords

Definition, digital divide, origin, views, information, device

1 Introduction

Information and communication technologies (ICT) are considered to be key potential factors in economic growth and social development (Srinuan & Bohlin, 2011). Information and communication technology has been recognized as a mechanism that plays an essential role in transforming various aspects of human lives, not only in the workplace, but also in the homes of people around the world (De Lange & Von Solms, 2012). Access to ICT has a specific impact in the educational, social, economic and medical fields (De Lange & Von Solms, 2012; Baker, Wagner, Singer, & Bundorf, 2003). It has transformed the way people work, socialise, discover and disseminate information (Haseloff 2005; Guomundsdottir 2005). Despite the rapid growth of ICT, its access and use are still far from being distributed equally around the globe; this applies particularly to the internet (Haseloff, 2005). Though the diffusion of ICT drives access to information and knowledge, the uneven distribution of ICT within or between communities may result in an uneven impact on their economic development and social experiences resulting in the digital gap (Srinuan & Bohlin, 2011).

This gap is seen as a digital divide between ICT users and it exists at different socio-economic levels; and also refers to peoples’ opportunities to access ICT and their knowledge in terms of using

the internet for a wide variety of activities (Smith, 2003; Oecd, 2001). The digital divide has some specific socio-economic implications that may have both direct and indirect impacts on the lives of people.

The digital divide has been a problem since the early days of ICT and as the different aspects of ICT are evolving, the digital divide is taking on different forms and dimensions. The digital divide has become an extremely important issue facing international organizations and poses a serious challenge for policy makers and academic researchers (Billon, Marco & Lera Lopez, 2009). This paper recognizes the efforts made by international organizations, governments of different nations and digital divide researchers to address the challenges of the digital divide.

The term «digital divide» has been viewed differently by individual researchers. The factors that underpin the researchers' views and understanding of the digital divide continue to shape and influence the various proposed frameworks. Despite the vast body of research on the digital divide, there are few attempts to review the literature of the various researchers regarding the digital divide. This paper thus aims to analyse and review the academic literature in this regard. The following will be examined: journal articles, conference papers and books on the digital divide.

This paper will focus only on scholarly articles dealing with the digital divide. In order to achieve its objective, the paper will review journal and conference articles published between 2000 and 2014. This article consists of the following sections: introduction, research method, origin of the digital divide, definition and views of the factors that play a role in the digital divide, and concluding remarks.

2 Research method

The literature reviewed in this paper includes journal articles, conference papers and books published between 2000 and 2014. Since the digital divide is a research area of interdisciplinary concern, the literature reviewed was sourced from a number of different areas such as information technology and information science, social science and education, and economics and management sciences.

3 Digital divide: its origin and defining moment

The origin of the digital divide can be traced to the mid-1990s (Ting, 2014) and since then it has become a popular area of interdisciplinary concern (Srinuan & Bohlin, 2011; van Dijk, 2000) (Srinuan & Bohlin 2011; van Dijk, 2000). Studies and publications refer to the US Department of Commerce's National Telecommunications and Information Administration (NTIA) as the founder of the term "digital divide". However, according to Gunkel the term did not originate from NTIA (Gunkel, 2003). Though the NTIA were the first to use the term in an official publication in the public domain (through NTIA's reports), the term can be traced to an unknown American source in the middle of the 1990s. In his article entitled, "Second thoughts; towards a critique of the digital divide", Gunkel refers to Larry Irving's explanation of the origin of the term (Gunkel, 2003). Larry Irving (who at the time was the US Department of Commerce Assistant Secretary for Communications and Information) indicates that Jonathan Webber of the Industry Standard made a case that he and Amy Harmon (both from the LA Times) invented the term (Gunkel, 2003). Gunkel argues that despite the claim by Jonathan Webber, NTIA's report played an important role in the redefinition and popularity of the term (Gunkel, 2003).

As the computer and the internet began to evolve, the need to use the concept of the digital divide to accommodate the various other divides began to increase (Compaine, 2001; Warschauer, 2004). In the

early days of ICT, before the subject of unequal access and use of modern technology were examined, people usually referred to more general concepts in this regard, such as “information rich”, “information poor”, or “information ‘haves’ and ‘have-nots’”, “information inequality”, “information gap” or “knowledge gap”, and “computer or media literacy” (Gudmundsdottir, 2005; van Dijk 2006). These were problematic terms according to Gudmundsdottir (2005) as they embraced an ethnocentric way of looking at the divide, cutting off those who did not have access to ICT and labelling them as people without information (Gudmundsdottir, 2005). The “digital divide” as a term became popular among interested parties, such as scholars and policy makers, in the late 1990s (Srinuan & Bohlin, 2011; van Dijk, 2000). Despite the different terms proposed to refer to the uneven access to ICT, the term “digital divide” is still commonly used. In the section below, we will examine the definition of the digital divide and the researchers’ views of the term.

4 Definitions and views of the underlying determinant factors

The definition of the digital divide during the mid-1990s was relatively broad and the concept was loosely used to express either the inequality between people in their access to ICT or, more particularly, the inequality in their access to the internet (Srinuan & Bohlin, 2011). However, at the end of the 1990s, academics and researchers started to make a conscious effort to define the digital divide more accurately.

The digital divide remains one of the unclear, confusing and most discussed social phenomena of our era (Warschauer, 2001). Though there is no universally accepted definition of the term, many of the widely accepted definitions share a common origin (Gebremichael & Jackson, 2006). This research takes cognisance of the fact that the various types of literature view the concept of the digital divide differently and thus their definition of the concept varies. In order to understand the meaning of the digital divide, the term will be looked at from the following different views such as information and device, geographical and research views.

4.1 Information and device

Initially, the term “digital divide” referred to the gap in access to a computer which was an ICT device. The discussion of the digital divide was underpinned by an element of digital technological determinism (Srinuan & Bohlin, 2011). In some of the literature the term is defined as a divide in terms of access or no access to information (DiMaggio et al. 2001; Gudmundsdottir 2005; Gyamfi 2005; van Dijk 2006) also known as the information “have and have nots”. Norris (2001) refers to this divide as a social divide (Norris, 2001).

Some researchers define the digital divide as a divide in terms of access or no access to ICT devices (for example, computers and mobile phones) or the internet (network connections) (Bagchi, 2014; Belden, 2004; Ferro, Helbig, & Gil-Garcia, 2011; Howland, 1998). NATIA (1999) define the digital divide as the divide between those who have access to ICT and those who don’t, while other scholars refer to the digital divide as a divide in both computers and the internet (Gebremichael & Jackson 2006; Gunkel 2003; Harris 2002; Mariscal 2005; Oecd 2001; Srinuan & Bohlin 2011; van Dijk 2006; Warschauer 2013)

Most literature between the late 1990s and early 2000s reported on empirical studies which used technological determinism and focused on the equalization of access to ICT in relation to physical access (Lentze & Oden 2001; Lim 2001; Moss, 2002; James, 2002; Meng & Li 2002; Chowdary,

2002; Hartviksen, Akselson & Eidsvik, 2002; James, 2003). For such researchers there is a nexus between access to digital technology and the digital divide, meaning that access to digital technology results in bridging the digital divide. Many other academic researchers in the year 2003 also considered access to digital technologies as determinant factors in bridging the digital divide. Most of them maintained that access to digital technologies demonstrates the availability of infrastructure which in turn predicts the extent of the use of ICT (Fink & Kenny, 2003; Sharma & Gupta, 2003; Brown & Licker, 2003; Breiter, 2003; Cullen, 2003; Roseman, 2003; Roycroft & Anantho, 2003).

Between 2004 and 2005 researchers discussed the necessity of resolving the digital divide which could be done by making the infrastructure available. These researchers believed that access to digital technologies was important and could facilitate the bridging of the digital gap (Bozionelos, 2004; Jayakar, 2004; Pook & Pence, 2004; Mutula, 2004; Kebede, 2004; Eastman & Iyer, 2004; Mwesige, 2004; Kanungo, 2004; Oyelaran-Oyeyinka & Lal, 2005; Sun & Wang, 2005; Fairlie, 2005; Chin, 2005; Hawkins, 2005; Bagechi, 2005; Hubregtse, 2005; Kalusopa, 2005). Other scholars between the years 2006 and 2007 proposed that the main determinant factor of the digital divide was access to digital technologies. This group of scholars and researchers focused on the availability of infrastructure, particularly digital technologies as an essential factor in closing the digital gap (Deichmann, 2006; Gibbons & Ruth, 2006; Demoussis & Giannakopoulos, 2006; Mutula & van Brakel, 2006; Hassani, 2006; Cava-Ferreruela & Alabau-Munoz, 2006; Huang & Russell, 2006; Xiong, 2006; Vicente Cuervo & Lopez Menendez, 2006; Robertson et al., 2007; Alam & Ahsan, 2007; Blackman, 2007; Ono & Zavodny, 2007; LaRose et al., 2007; Teo, 2007; Beynon-Davies & Hill, 2007; Guasch & Ugas, 2007; Powell, 2007; Ryder, 2007; Warren, 2007). Between 2008 and 2010 some academic researchers followed a more inclusive approach in addressing the issue of the digital divide; however, some supporters of the digital technological determinism approach still maintained that technological change closes the digital gap resulting in the liberalization and opening up of markets (Cooke & Greenwood, 2008; Wood, 2008; Yuguchi, 2008; Ishmale et al., 2008; Singh & Sahu, 2008; Engellbrecht, 2008; Gomez-Barroso & Robles-Rovalo, 2008; Kim, 2008; Hohlfeld et al., 2008; Noh & Yoo, 2008; Szabo et al., Ganapati & Schoepp, 2008; Igun & Olise, 2008; Avila, 2008; Klimaszewski & Nyee, 2009; Salinas & Sanchez, 2009; Ashraf et al., 2009; Cilan et al., 2009; Pal, 2009; Liao & Chang, 2010; Emrouznejad et al., 2010; Niehaves et al., 2010; Puga et al., 2010; Wilbon, 2010; Yu, 2010; Pieri & Diamantinir, 2010; Wetze, 2010). Other researchers have drawn a direct link between the level of ICT infrastructure and the level of digital equality. Therefore, the diffusion rate of the ICT infrastructure, particularly the internet, is in their opinion the sine qua non ultra in addressing the digital gap (Hawkins, 2005; Pook & Pence; 2004; Noh & Yoo, 2008; Avila, 2009).

As the internet found its way rapidly into society, the term shifted to include not only the gap in computer devices but also the gap in access to the internet technology (Van Deursen & Van Dijk, 2011; Warschauer, 2013).

4.2 Skill and literacy

As increasingly more divides began to emerge, researchers started to broaden their definitions and views of the digital divide to include the skill or knowledge divide (Bagchi, 2014; Cullen, 2001). Some academic researchers focused on the lack of ICT skills and experience that they believed were underlying factors that widened the digital divide (Sexton et al., 2002; Brown & Licker, 2003; Kebede, 2004; James, 2004; Eastman & Iyer, 2004; Kalusopa, 2005; Xiong, 2006; Mutula & van Brakel, 2006; Selwyn, 2006; van Dijk 2006; Reisenwitz et al., 2007; Hitt & Tambe, 2007; LaRose et

al., 2007). While the discussions on the digital divide continue and its definition is continuously broadened to accommodate other factors, some scholars still maintain that the lack of skill plays a major role in bridging the digital gap (Tien & Fu, 2008; Hill et al., 2008; Vie, 2008; Srite et al., 2008; Cilan et al., 2009; Salinas & Sanchez 2009; van Deursen & van Dijk, 2009; Yu, 2010; Waycott et al., 2010; Gauld et al., 2010; Wilbon, 20110; Salajan et al., 2010).

According to some researchers, education and knowledge play a critical role in bridging the digital divide, and education plays an important role in analysing the digital divide, and thus they have focused on education (Lim, 2002; Hartviksen et al., 2002; Rice & Katz 2003; Sharma & Gupta, 2003; Brown & Licker, 2003; Hollifield & Donnermeyer, 2003; Akhter, 2003; Kanungo, 2004; Simpson et al., 2004; Eastman & Iyer, 2004; Wareham et al., 2004; Mwesige, 2004). Other researchers emphasise literacy as the underlying factor that needs to be addressed when examining the issue of the digital divide. Essentially, in order to bridge the gap attention must be paid on improving peoples' level of literacy (Kalusopa, 2005; Bagchi, 2005; Azari & Pick, 2005; Fairlie, 2005; Demoussis & Giannakopoulos, 2006; Cava-Ferreruela & Alabbau-Munoz, 2006; de Koning & Gelderblom, 2006; Hassani, 2006; Diechmann et al, 2006; Peter & Valkenburg, 2006; Xiong, 2006; Selwyn, 2006; van Dijk, 2006).

Between 2007 and 2010 many researchers, although not all, focused on the necessity of education in defining the digital divide (Robertson et al., 2007; Flamm & Chaudhuri, 2007; Warren, 2007; Beynon-Davies & Hill, 2007; Ono & Zavodny, 2007; Dwivedi & Lal, 2007; Zhao et al., 2007; Noce & McKeown, 2008; Cooke & Greenwood, 2008; Ameen & Gorman, 2009; Noh & Yoo, 2008; Goldfarb & Prince, 2008; Rice & Katz, 2008; Prieger & Hu, 2008; Engelbrecht, 2008; Vie, 2008; Billon et al., 2009; Orviska & Hudson, 2009; Klimaszewski & Nyce, 2009; Shirazi et al., 2009; Moon et al, 2010; Liano & Chang, 2010). Norris (2001) extended the definition of the digital divide to accommodate the democratic divide which is a divide between those who do and those who do not use digital resources to engage, mobilize and participate in public life due to lack of skills (Norris, 2001).

4.3 Geographical view

In addition to defining the digital divide as a divide in terms of access to information, computers, or the internet as well as in terms of skill and literacy, the digital divide can also be defined in relation to population and geographical location of an area. For example, it is important to know whether a certain place is urban or rural. Some of the literature has examined the digital divide in relation to geography and population (Cullen, 2001; Rao, 2005; Srinuan & Bohlin, 2011b) Rowe, 2003; Cullen, 2003; Wareham et al., 2004; Simpson et al., 2004; Whaley, 2004; (Cullen, 2001; Rao, 2005; Srinuan & Bohlin, 2011b) Chin, 2005; Mariscal, 2005; Chaudhuri et al, 2005; Bagchi, 2005; Selwyn, 2006; Akea et al., 2007; Flamm & Chaudhuri, 2007).

In some studies from 2008 to 2009 researchers have argued that urban populations have easier and cheaper access to ITC and its accompanying infrastructure compared to rural populations. They believed that the cost of adopting ICT infrastructure could decrease as the population increased (Noce & McKeown, 2008; Goldfarb & Prince, 2008; Wood, 2008; Yuguchi, 2008; Yartey, 2008; Prieger & Hu, 2008; Savage & Waldman, 2009; Orviska & Hudson, 2009; Billon et al., 2009).

There is a correlation between population density in a particular area and access to ICT (Gauld et al., 2010; Chen et al., Schleife, 2010; Moon et al., 2010; Liao & Chang, 2010; Park & Jayakar, 2010). The digital divide can also be seen as a divide that exists (1) between countries, developed and

developing, i.e. the global digital divide; (2) within a continent and sub-continent, for example South Africa and Zimbabwe, i.e. a regional digital divide; and (3) within a country, between urban and rural areas, i.e. a national digital divide (Cullen, 2001; Rao, 2005; Srinuan & Bohlin, 2011b). The researchers who uphold the geographical view of the digital divide are influenced by geographical determinant factors. This manner of defining the digital divide is in line with the first digital divide group in terms of Kallol's three ways of grouping research on the digital divide (Bagchi, 2005).

4.4 Other views of the digital divide

The literature also defines the digital divide in terms of other factors such as age (Akhter, 2003; Rice & Katze, 2003), occupation (Azari & Pick, 2005; Salajan et al., 2010), gender (Winker, 2005; Tien & Fu, 2008), culture (Zhao et al., 2007; Al-Jaghoub & Westrup, 2009), language (Chin, 2005; Al-Jaghoub et al., 2009), content (Mwesige, 2004; Salajan et al., 2010) and attitude towards ICT (Cullen, 2003; Wilbon, 2003). Some scholars and critics argue that age plays a major role in the usage of ICT (Hollifield & Donnermeyer, 2003; Peter & Vlakenburg, 2006; Noce & McKeown, 2008; Middleton & Chambers, 2010). Young people in general, especially teenagers, show greater interest in using ICT than elderly people. The latter are often reluctant to adopt evolving technologies and always find excuses for not using them (Whaley, 2004; Fairlie, 2005; de Koning & Gelderblom, 2006; Beynon-Davies & Hill, 2007; Flamm & Chaudhuri, 2007; Dwivedi & Lal, 2007; Goldfarb & Prince, 2008; Abbey & Hyde, 2009). In order to succeed in addressing the issue of the digital divide and improve the level of ICT dissemination, it is essential to consider the age factor as one of the underpinning elements of the digital divide (Ono & Zavodny, 2007; Prieger & Hu, 2008; Orviska & Hudson, 2009; Pieri & Diamantini, 2010; Schleife, 2010; Salajan et al., 2010).

Another factor that plays a significant role in defining the digital divide is occupation (Rice & Katz, 2003; Chaudhuri et al., 2005). Supporters of this view maintain that workers in the scientific, research and technical fields as well as professionals such as accountants and lawyers are more likely to use ICT than others (Wareham, 2004; Dwivedi & Lal, 2007; Billon et al., 2009; Schleife, 2010). Some academic writers define the digital divide in relation to gender (Sexton et al., 2002; Peter & Valkenburg, 2006; Alam et al., 2009). A few scholars believe that the male population in general are likely to access and use ICT tools more than the female population (Trauth, 2002; Akhter, 2003; Selwyn, 2006; Flamm & Chaudhuri, 2007; Orviska & Hudson, 2009).

There is little research on the impact of culture (Praboteeah et al., 2005) and language (Roycroft & Anantho, 2003) on the level, access and use of ICT. A small number of academic researchers tend to define the digital divide in relation to culture. They argue that people belonging to a particular cultural group and orientation may have a peculiar perception of ICT that may cause them to easily adopt new technologies resulting in either increasing or reducing the rate of ICT dissemination (Hubregtse, 2005; Hill et al., 2008; Srite et al., 2008; Klimaszewski & Nyce, 2009). Some academic writers are of the view that the digital divide can also be defined in relation to language. The promoters of this view maintain that language plays a significant role in the readiness of people in accessing and using ICT (Gamage & Halpin, 2007; Wetzl, 2010). Content can also serve as a determinant factor in the digital divide (Ngini et al., 2002; Rao, 2005; Mutula & van Brakel, 2006; Vie, 2008). Some researchers define the digital divide in relation to content which can either draw people away from using the internet or promote their desire to access and use the internet (Kebede, 2004; Kalusopa 2005; Alam & Ahsan, 2007; Sang et al., 2009). Content that fulfils the needs of users will enhance their interest in using the ICT (Kuk, 2002; Simpson et al., 2004; Sun & Wang,

2005; Peter & Valkenburg, 2006; Teo, 2007; Tien & Fu, 2008; Sang et al., 2009; Orviska & Hudson, 2009; Waycott et al., 2010).

Also people's attitude towards the evolving digital technologies and the internet in particular may be considered relevant in addressing the issue of the digital divide (Oxedine et al., 2003; Broos & Rose, 2006; Reisenwitz et al., 2007; Chen et al., 2010). The psychological impact of ICT on people is also important to consider. People experienced in the use of the internet may either deterred them from further use or accelerate their access and use of internet (Hinson & Sorensen, 2006; Waycott et al., 2010). Trust in the benefits of the Internet and a positive attitude towards the use of ICT certainly influence its adoption resulting in an improved dissemination rate and a reduction in the digital gap (Brown & Licker, 2003; Jackson et al., 2003; van Dijk, 2006; Klecum, 2008; Carter & Weerakkody, 2008; Das et al., 2009; Gomez & Gould, 2010; Pieri & Diamantinir, 2010). The different views of digital divide discussed in this paper together with the related literatures are summarized in table 1.

Table 1
Views of Digital divide

Views of digital divide	Authors and years
Information and device view	DiMaggio et al. 2001; Gudmundsdottir, 2005; Gyamfi, 2005; van Dijk, 2006; Norris, 2001; Bagchi, 2005; Belden, 2004; Ferro, Helbig& Gil-Garcia, 2011; Gebremichael& Jackson, 2006; Gunkel, 2003; Harris, 2002; Mariscal, 2005; Oecd, 2001; Srinuan&Bohlin, 2011; Warschauer, 2012; Lentze& Oden, 2001; Lim, 2002; Moss, 2002; James, 2002; Meng& Li, 2002; Chowdary, 2002; Hartviksen, Akselson&Eidsvik, 2002; James, 2003; Fink & Kenny, 2003; Sharama& Gupta, 2003; Brown & Licker, 2003; Breiter, 2003; Cullen 2003; Roseman, 2003; Roycroft&Anantho, 2003; Bozionelos, 2004; Jayakar, 2004; Pook& Pence, 2004; Mutula, 2004; Kebede, 2004; Eastman &Iyer, 2004; Mwesige, 2004; Kanungo, 2004; Oyelaran-Oyeyinka& Lal, 2005; Sun & Wang, 2005; Fairlie, 2005; Chin, 2005; Bagechi, 2005; Hubregtse, 2005; Kalusopa, 2005; Deichmann et al, 2006; Gibbons & Ruth, 2006; Demoussis& Giannakopoulos, 2006; Mutula& van Brakel, 2006; Hassani, 2006; Cava-Ferreruella&Alabau-Munoz, 2006; Huang & Russell, 2006; Anna Xiong, 2006; Cuervo& Lopez Menendez, 2006; Robertson et al., 2007; Malaysia, 2007; Blackman, 2007; Ono &Zavodny, 2007; LaRose et al., 2007; Teo, 2007; Beynon-Davies & Hill, 2007; Guasch&Ugas, 2007; Powell, 2007; Ryder, 2007; Warren, 2007; Cooke & Greenwood, 2008; Wood, 2008; Yuguchi, 2008; Ishmael et al., 2008; Singh &Sahu, 2008; Engellbrecht, 2008; Luis Gomez-barroso& Robles-Rovalo, 2008; Kim, 2008; Hohlfeld et al., 2008; Noh &Yoo, 2008; Szabo et al., Ganapati &Schoepp, 2008; Igun&Olise, 2008; Avila, 2008; Klimaszewski&Nyee, 2009; Salinas & Sanchez, 2009; Avila, 2009; Ashraf et al., 2009; Cilan et al., 2009; Pal, 2009; Liao & Chang, 2010; Emrouznejad et al., 2010; Niehaves et al., 2010; Puga et al., 2010; Wijers, 2010; Yu, 2010; Pieri&Diamantinir, 2010; Wetze, 2010; Van Deursen& Van Dijk, 2011; Oyedemi, 2012;
Skill and literacy view	Norris, 2001; Bagchi, 2005; Cullen, 2001; Harris 2002; Sexton et al., 2002; Brown & Licker, 2003; Kebede, 2004; James, 2004; Eastman &Iyer, 2004; Kalusopa, 2005; Anna Xiong, 2006; Mutula& van Brakel, 2006; Selwyn, 2006; van Dijk, 2006; Reisenwitz et al., 2007; Hitt&Tambe, 2007; LaRose et al., 2007; Tien & Fu, 2008; Hill et al., 2008; Vie, 2008; Srite et al., 2008; Cilan et al., 2009; Salinas & Sanchez 2009; van Deursen& van Dijk, 2009; Yu, 2010; Waycott et al., 2010; Gauld et al., 2010; Wijers, 2010; Salajan et al., 2010; Lim, 2002; Hartviksen et al., 2002; Rice & Katz, 2003; Sharma & Gupta, 2003; Brown & Licker, 2003; Hollifield&Donnermeyer, 2003; Akhter, 2003; Kanungo, 2004; Simpson et al., 2004; Eastman &Iyer, 2004; Wareham et al., 2004; Mwesige, 2004; Kalusopa, 2005; Bagchi, 2005; Azari & Pick, 2005; Fairlie, 2005; Demoussis& Giannakopoulos, 2006; Cava-Ferreruella&Alabbau-Munoz, 2006; de Koning& Gelderblom, 2006; Hassani, 2006; Diechmann, 2006; Peter &Valkenburg, 2006; Anna Xiong, 2006; Selwyn, 2006; van Dijk, 2006; Robertson et al., 2007; Flamm& Chaudhuri, 2007; Warren, 2007; Beynon-Davies & Hill, 2007; Ono &Zavodny, 2007; Dwivedi& Lal, 2007; Zhao et al., 2007; Noce& McKeown, 2008; Cooke & Greenwood, 2008; Ameen & Gorman, 2008; Noh &Yoo, 2008; Goldfarb & Prince, 2008; Rice & Katz, 2008; Prieger& Hu, 2008; Engelbrecht, 2008; Vie, 2008; Billon et al., 2009; Orviska& Hudson, 2009; Klimaszewski&Nyce, 2009; Shirazi et al.,

Geographical view	2009; Moon et al, 2010; Moon et al., 2010; Liano& Chang, 2010; Bagchi, 2005; Cullen, 2001; Rao, 2005; Srinuan, 2011; Rowe, 2003; Cullen, 2003; Wareham et al., 2004; Simpson et al., 2004; Whaley, 2004; Chin, 2005; Mariscal, 2005; Chaudhuri, 2005; Bagchi, 2005; Selwyn, 2006; Akea et al., 2007; Flamm& Chaudhuri, 2007; Noce& McKeown, 2008; Goldfarb & Prince, 2008; Wood, 2008; Yuguchi, 2008; Yartey, 2008; Prieger& Hu, 2008; Savage & Waldman, 2009; Orviska& Hudson, 2009; Billon et al., 2009; Gauld et al., 2010; Chen et al., Schleife, 2010; Moon et al., 2010; Liao & Chang, 2010; Park & Jayakar, 2010; Srinuan&Bohlin, 2011;
Other views of the digital divide are:	
Culture and Language	Praboteeah et al., 2005; Roycroft&Anantho, 2003 ; Hubregtse, 2005; Hill et al., 2008; Srite et al., 2008; Klimaszewski&Nyce, 2009; Gamage&Halpin, 2007; Wetzl, 2010; Zhao et al., 2007; Al-Jaghoub&Westrup, 2009; Chin, 2005; Alam et al., 2009; Harris, 2002;
Content	Ngini et al., 2002; Rao, 2005; Mutula& van Brakel, 2006; Vie, 2008; Kebede, 2004; Kalusopa 2005; Malaysia, 2007; Sang et al., 2009; Harris, 2002; Kuk, 2002; Simpson et al., 2004; Sun & Wang, 2005; Peter & Valkenburg, 2006; Teo, 2007; Tien & Fu, 2008; Sang et al., 2009; Orviska& Hudson, 2009; Waycott et al., 2010;
Attitude and occupation	Cullen, 2003; Wilbon, 2003; Oxedine et al., 2003; Broos& Rose, 2006; Reisenwitz et al., 2007; Chen et al., 2010; Hinson & Sorensen, 2006; Waycott et al., 2010 ; Brown & Licker, 2003; Jackson et al., 2003; van Dijk, 2006; Klecum, 2008; Carter & Weerakkody, 2008; Das et al., 2009; Gomez & Gould, 2010; Pieri&Diamantinir, 2010; Rice & Katz, 2003; Chaudhuri et al., 2005; Wareham, 2004; Dwivedi& Lal, 2007; Billon et al., 2009; Schleife, 2010; Azari & Pick, 2005; Salajan et al., 2010; Harris; 2002
Age and gender	Hollifield&Donnermeyer, 2003; Harris, 2002; Peter & Vlakenburg, 2006; Noce& McKeown, 2008; Middleton & Chambers, 2009; Whaley, 2004; Fairlie, 2005; de Koning& Gelderblom, 2006; Beynon-Davies & Hill, 2007; Flamm& Chaudhuri, 2007; Dwivedi& Lal, 2007; Goldfarb & Prince, 2008; Abbey & Hyde, 2009; Ono & Zavodny, 2007; Prieger& Hu, 2008; Orviska& Hudson, 2009; Pieri&Diamantinir, 2010; Schleife, 2010; Salajan et al., 2010; Sexton et al., 2002; Peter & Valkenburg, 2006; Alam et al., 2009; Trauth, 2002; Akhter, 2003; Selwyn, 2006; Flamm& Chaudhuri, 2008; Orviska& Hudson, 2009; Rice & Katze, 2003; Winker, 2005; Tien & Fu, 2008.

The digital divide views summarized in table 1 are the dominating views according to literature. The next section concludes the research findings and gives possible suggestions.

5 Concluding remarks

This paper shows that there are various definitions of the digital divide and that these definitions are informed by certain factors which are regarded by researchers as significant. There is no one definitive definition since each definition and analysis of the digital divide reflects the viewpoint of the specific scholar. Some scholars in an attempt to define the digital divide tend to accommodate various factors. For example, some scholars believe that the digital divide is a gap that exists in both the computer itself and the internet. Thus, the divide can exist within the two digital aspects, namely in the information and communication technology (ICT) devices on the one hand and the internet on the other. According to the Organisation for Economic Cooperation and Development, the term “digital divide” refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels (OECD, 2001). In the same vein, the digital divide is also defined in relation to the opportunities that people have in accessing information and communication technologies (ICT), and their use of the internet for a wide variety of human activities (OECD, 2001; Smith, 2003).

Since the issue of digital divide can have both positive and negative implications on humanities and in the societies, this paper suggests a more comprehensive and inclusive approach towards defining

digital divide and that the various underlying factors should be taken into account. Since all the factors directly or indirectly contribute to the digital gap, it is recommended that a holistic approach be taken in examining the digital divide. The different views concerning the digital divide show that research on the digital disparity has transcended the technological access approach.

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