

Approaching the digital divide in South Africa

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NETREED Conference

5-7 December 2005 at Beitostølen, Norway

The Birth of the Digital Divide

During the last decades dramatic changes have taken place in our every day lives and work due to the developments within information technology¹. Conversely, it soon became clear that only a small part of the world's population gained from these changes and some segments of the global society are totally disconnected from using this technology. In Africa for example, only a fraction of people have regular access to computers and the Internet, the most powerful tools of these changes.

The issue of difference in access long preceded the concept of the digital divide. More than thirty years ago the notion of international technological dualism was introduced by Hans Singer. Singer maintained that technological dualism refers to an unequal development in technology and science between rich and poor countries (Singer, 1970, pp. 105-106). Connecting the technological dualism to the digital divide that currently exists, James (2003) points out that:

IT [information technology] is in many respects a reflection of the same pattern of international technological dualism that has helped to produce the pronounced gap in incomes between rich and poor countries. From this point of view, the digital divide... ..is merely another technological gap that emanates from and reflects the highly skewed distribution of global research expenditures between the north and the south (James, 2003, p. 23).

During the early days of ICT people often made reference to information rich and information poor countries or more commonly the term *information haves* and *information have nots*. These are problematic terms as they embrace an ethnocentric way of looking at the divide, cutting off those that do not have access to ICT as being people, literally speaking, without information².

As the use of computers and the Internet developed and escalated, more and more people started using the concept *digital divide* as a term describing the enormous divide (Compaine, 2001; Monroe, 2004; Norris, 2001; Warschauer, 2004). Notably

¹ Abbreviated IT or ICT for information and communication technology.

² In this respect Edward Said's book on "Orientalism" (Said, 2003) is of interest as he argues how ethnocentric views have consistently defined the 'other' from a Eurocentric viewpoint.

many studies have pointed out that ICT has not lived up to its expectations. Monroe (2004) argues that, oddly enough, these studies are based on schools in high economic status communities whereas the situation in low economic status communities is even more extreme. This is further confirmed by a well known study by Larry Cuban (2001) where he found schools in the Silicon Valley being relatively well equipped, but the computers were just occasionally exploited and used in the teaching practises. Studies like these bring us closer to the latest preference in the discussion of the digital divide. The focus has increasingly moved from the material access to the skills and opportunities that one has to possess to use the tool. Just like having access to books does not mean that you are able to read them, not to mention to use their content to your own benefit. The same can be seen as relevant for computer and Internet use, thus access does not guarantee the ability to use or make use of the technology. In this paper I will consider some of the different approaches and perspectives on the area of access with respect to the digital divide concept and, in particular, focus on the divide in South Africa.

A number of learners claim that the digital divide in the world is decreasing due to greater access to computers and the Internet, together with cheaper software and hardware. The opposite will be stated here as long as influencing factors such as language and other social, cultural and historical factors are not addressed to a greater extent. Various educational researchers have focused on the influence and appearance of the digital divide in different educational settings (Campbell, 2001; Murelli, 2002; Norris, 2001; van Dijk & Hacker, 2003) and a great deal of research has been conducted on the influence of multilingualism, bilingualism and the language of instruction (Bialystok, 2001; Brock-Utne, Desai, & Qorro, 2003; , 2004; Brock-Utne & Hopson, 2005; Cummins, 2000; Hólmarsdóttir, 2005; Romaine, 1995; Skutnabb-Kangas, 2000). However, research on the influence of language and the influence of linguistic background of students on computer use, their attitudes and skills is much more limited. Additionally, much of the research that has been conducted on computer use in education or at least the research that is widely accessible by the research community is for the most part conducted in English speaking countries (Jakobsdóttir, 2004). What makes South Africa interesting in terms of the digital divide is the country's multi-ethnic and multi-lingual profile. The cultural background of the people reflects, for example, the different mother tongues and language use of students. South Africa is

one of the African countries with highest Internet diffusion per capita covering about 10% of the total population.

The many different Divides

As stated earlier Internet use is restricted to a relatively small group of the total world's population. The most common use of the digital divide concept has been to divide according to geographical or regional lines, like the North-South divide or the 'West and the rest'. According to an estimate for 2005 from *Internet World Statistics*³ there are 964 million people connected⁴ to the Internet or 15% of the world's population (see figure I). Out of these, 33.9% of the world's users are from Asia, 29.4% are from Europe, 23.2% are from North America and only 2.5% of the world's users are located in Africa (see figure II).

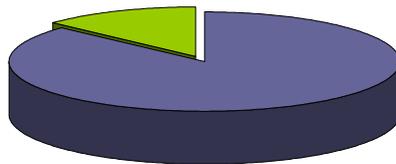


Figure I. 15% of the world population have access to the Internet.
("Internet World Statistics", 2005)

³ <http://www.internetworldstats.com/stats.htm>

⁴ "The ITU [International Telecommunication Union] subscribes to the definition of an Internet user as someone aged 2 years old and above, who went online in the past 30 days. The US Department of Commerce, in contrast, defines Internet users as those 3 years or older who 'currently use' the Internet. The CNNIC [China Internet Network Information Center] defines the Internet user as a Chinese citizen, aged 6 or above, who uses the Internet at least one hour per week. Other market researchers have their own definitions. Internet World Statistics [IWS] believes that a definition must be as general and as simple as possible. For analyzing and comparing Internet users on a global scale, IWS adopts as its benchmark a broad definition and defines an Internet User as anyone currently in capacity to use the Internet. In our opinion, there are only two requirements for a person to be considered an Internet User:

- (1) The person must have available access to an Internet connection point, and
- (2) The person must have the basic knowledge required to use web technology.

...No need to make complex something that is really quite simple. In many Third World countries one same Internet connection may be shared by many individual users. Due to this reason, Internet users might outnumber the amount of Internet access subscribers and also outnumber the telephone lines available in each country" ("Internet World Statistics", 2005).

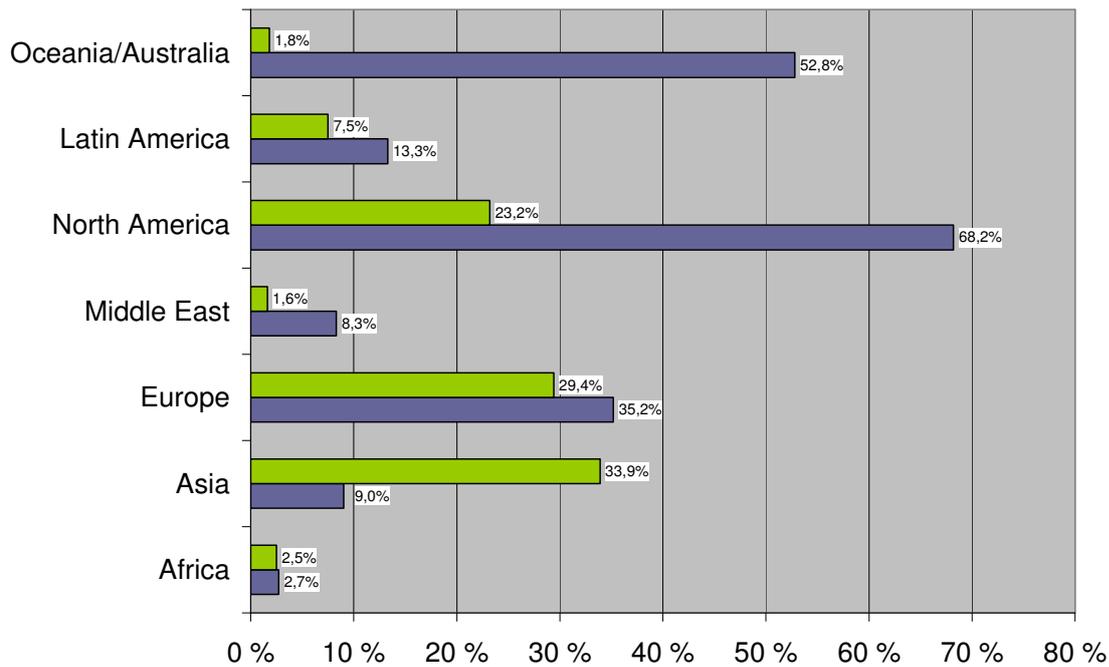


Figure II. World Users of the Internet (light column) by Region and Population Diffusion (dark column). ("Internet World Statistics", 2005)

Related to the global divide is the rural/urban divide which is considerable both in the West as well as in the rest of the world. Others are more preoccupied with the gender divide, generation divide or education-level divide. No matter which angle we choose, the access to the technology varies considerably.

In Africa as a whole only 2.7% of the total population has access to the Internet (see figure II), but in South Africa around 10% of the population has access (see figure III). Comparing with other parts of the world it is, however, the African continent that has the highest usage growth for 2000-2005 with an average growth of over 400%⁵. Looking at South Africa, in particular, it is the country with one of the highest population diffusion in Africa, with around 5 million users out of 48 million inhabitants. Similar numbers for the Scandinavian countries which are among the countries with highest Internet diffusion in the world, are Finland with 62.6% of the population with access to the Internet, Norway with 68.2%, Denmark having 69.5% Internet diffusion followed by Sweden with 73.6% of the population connected and finally Iceland with

⁵ It should be noted that the average growth is high somewhat due to the low Internet diffusion before 2000 in Africa. In Somalia for example, which has the highest average growth rate at 44,400%, it can be explained with the huge increase in use from 2000 (estimated 200 users) to 2005 (estimated 89000 users) ("Internet World Statistics", 2005). The growth rate should therefore be interpreted within this limitation.

over ¾ of their population connected (76.5%) of the total population using Internet ("Internet World Statistics", 2005).

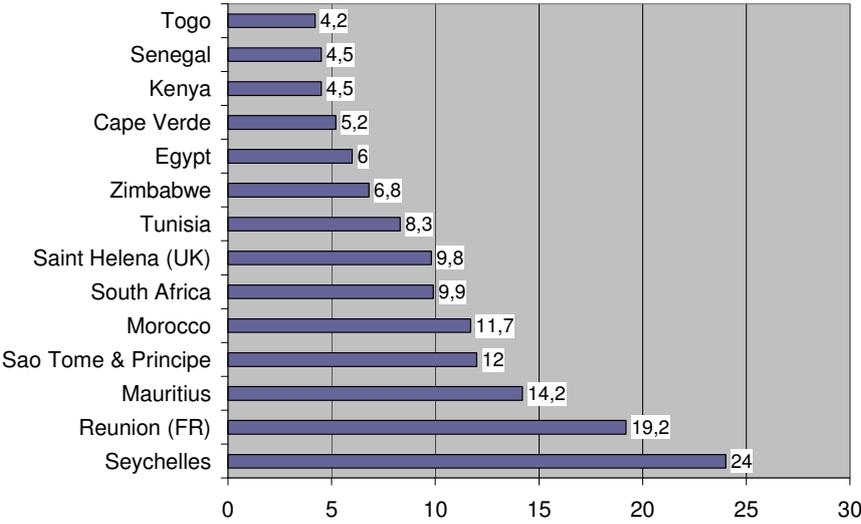


Figure III. The African countries with the highest population diffusion in percentage with regard to Internet access in November 2005 ("Internet World Statistics", 2005)

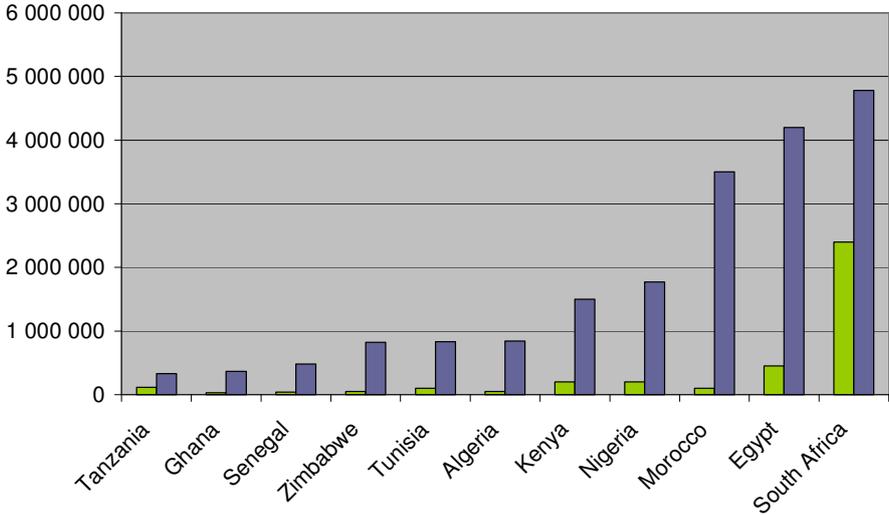


Figure IV. Countries with the highest number of users in Africa in December 2000 and November 2005 ("Internet World Statistics", 2005)

Lately there has been a growing tendency to approach the concept digital divide and look beyond the access issues, by arguing that equally important are the *skills to use* the technology. A part of the new tendency is to focus on lack of motivation and the ability to use ICT to your own benefit. Certainly this is connected to the area of functional

literacy and digital literacy (Saldanha, 2005; Sayed, 1998; Warschauer, 2004). A noteworthy outcome of a research conducted on the information literacy of university students in the Western Cape region shows a marked divide between students according to ethnic and social background (Sayed, 1998). Van Dijk (1999) declares the new divide as the problem of mental and material access versus the skills to use the tool (Norris, 2001; van Dijk, 1999; van Dijk & Hacker, 2003). Thus, even though we see an increase in the basic material access, digital skills, user's mentality and cultural appropriateness remain a hindrance.

Looking beyond Access

Defining the concept digital divide is far from being simple as one comes across different meaning and different understanding among those that are working within this area. Being a multidimensional phenomenon, referring to different divides or gaps, there are different ways to approach the concept.

Table I combines three different approaches of the digital divide which are useful in getting closer to the essence of the concept. Each of them goes beyond the access issue and shows different sides of the phenomenon. Notably van Dijk and Hacker (2003) together with Warschauer (2004) have a similar four-divided approach whereas the "bridges group"⁶ pulls in several other issues as well making the definition even more multifaceted. Looking at these definition (see table I) one can realise the complexity of the digital divide and how many factors one actually needs to consider when talking about the digital divide.

⁶ Bridges.org was founded in 2000 by Teresa Peters, together with a group of Internet visionaries who now sit on its board of directors. Its directors and advisors are leaders in business, academia, and international organizations. www.bridges.org mission is to promote the effective use of information and communications technology (ICT) in developing countries to improve people's lives (see further "The Bridges.org" at www.bridges.org).

Table I. Different Approaches to the Digital Divide Concept

Van Dijk and Hacker (2003)	www. bridges.org	Warschauer (2004)
<p>Mental Access Lack of elementary digital experience, lack of interest, computer anxiety and unattractiveness of the new technology</p>	<p>Socio-cultural factors Are people limited in their use of technology based on gender, race, or other socio-cultural factors?</p>	<p>Social resources Communities and Institutions</p>
<p>Material Access No possession of computers and network connections</p>	<p>Physical access Is technology available and physically accessible?</p> <p>Appropriate technology What is the appropriate technology according to local conditions, and how people need and want to put technology to use?</p> <p>Affordability Is technology access affordable for people to use?</p>	<p>Physical resources Computers and Connectivity</p>
<p>Skills Access Lack of digital skills caused by insufficient user-friendliness and inadequate education or social support.</p>	<p>Capacity Do people understand how to use technology and its potential uses?</p> <p>Relevant content Is there locally relevant content, especially in terms of language?</p> <p>Integration Does the technology further burden people's lives or does it integrate into daily routines?</p>	<p>Digital resources Content and Language</p>
<p>Usage Access Lack of significant usage opportunities</p>	<p>Trust Do people have confidence in and understand the implications of the technology they use, for instance in terms of privacy, security, or cyber crime?</p> <p>Legal and regulatory framework How do laws and regulations affect technology use and what changes are needed to create an environment that fosters its use?</p> <p>Local economic environment Is there a local economy that can and will sustain technology use?</p> <p>Macro-economic environment Is national economic policy conducive to widespread technology use, for example, in terms of transparency, deregulation, investment, and labour issues?</p> <p>Political will Is there political will in government to do what is needed to enable the integration of technology throughout society?</p>	<p>Human resources Literacy and Education</p>

Within a multi-ethnic and multi-lingual nation such as South Africa it can be argued that it would be of great importance to look beyond the access divide. van Dijk recognized four different kinds of barriers to access to network connection: These are the *mental access* which consists of lack of interest for the technology and computer anxiety, *material access* including the access to computers and Internet connection. van Dijk adds the *skills access* as inadequate education or training, lack of user friendliness etc. and finally he defines the *usage access* embracing the opportunities one has to access the technology (van Dijk, 1999).

Warschauer (2004) looks at the four divides based on physical resources, digital resources, human resources and finally social resources. Physical resources refer to access to computer and connectivity whereas the digital resources refer to the content and language used.

Warschauer's use of human resources is connected to education and literacy whereas the social resources are linked to macro level through institutions and communities. The Bridges group names the same issues as well as adding new ones but on the whole they can also be categorized in the four divisions together with van Dijk and Warschauer as can be seen in the compilation in table I.

The Digital Divide in Africa

Despite that ICT has already brought about many changes their potential to transform educational processes at a global level are far from being realized. It is unrealistic to think its influence will have a rapid and universal effect despite numerous initiatives throughout the African continent (Byron & Gagliardi, 2001). More to the point, Byron and Gagliardi continue by indicating several reasons for this. There are financial and administrative restraints as well as the need for further research in the field. Moreover socio-cultural and political factors are responsible for limited impact of ICT in education in some developing countries. Byron and Gagliardi mention resistance by authorities and teachers accompanying the linguistic and cultural inappropriateness of much educational software available, together with conflicts of traditional ways in transmitting and receiving information (Byron & Gagliardi, 2001). Many of these issues are the same as the Bridges group claimed are the factors influencing the digital divide (see table I). Yet, Castells (2000) claims that development without the World Wide Web in the information age is as unlikely as development within the industrial society without electricity.

However, ICT should not be seen as some kind of a magic wand with Western educational models as the panacea for educational development on the African continent. It is

moreover of the utmost importance that the introduction of new technology is coherent with the local situation and has relevance for the needs of the people involved. Future educational reforms and innovations need to be explicit with the nation's capabilities, situation and circumstances in order to serve the people and their respectable countries. van Audenhove et al. (1999) identify the great challenge of building up the capacity of expertise and adapting technology to developing countries' particular socio-cultural, economic and political environments. The importance of an indigenous initiative and abilities to establish, sustain and develop ICT should not be underestimated. "If the technology can be seized and harnessed for African use, defined by Africans, for African purposes and African development, then there is nothing lost in the delay in adopting these technologies" (Breslar, 2000, pp. 7-8).

Chen and Wellman state that with the proliferation of Internet use in developing countries the digital divide is statistically narrowing even though it remains substantial and is becoming greater due to lack of skills. Further they argue that "people, social groups and nations on the wrong side of the digital divide may be increasingly excluded from knowledge based societies and economies" (Chen & Wellman, 2004, p. 39)

In 1994 the "new" South Africa was born and great optimism and hope characterised the nation. "Many people anticipated that new policies and firm measures of redress would contribute to the creation of a more equitable and fair society, and enable South Africa to become a player in the global community" (Czerniewicz, 2004, p. 145). Czerniewicz continues by saying that despite that the South African government is clear on the importance of fighting the digital divide and taking part in the new informational economy there is little attention at the macro level on the issue. In a green paper from the Ministry of Communication in South Africa it is stated that one of the aims of educational authorities is to increase digital literacy and that everyone in South Africa should acquire basic digital literacy skills (SADoC, 2000, p. 11).

Cultural Relevance and the Language Issue

As to the cultural relevance for ICT and Internet use an interesting research study was done on the use of information technology among the Maori in New Zealand. Cullen (2003) came to the conclusion that one of the reasons why some societal groups do not find it feasible to use ICT or gain the skills to use the medium is that the content is not meaningful for the group. Cullen claims that this can be used as an explanation for other groups in the society

such as older people, women, ethnic groups and other minorities in the society. Similarly van de Bunt-Kokhuis (2001) claims that the content of the Internet is not always interesting or has relevance for students in the South.

Kenneth Keniston (2001) has, together with other researchers, looked at the influence of language on the use of computers and computer communication in developing countries. He discusses to what extent the English language influences power structures in the society between the rich and the poor, the elite and the lower classes and to what extent this influences use and access to ICT (Auh, 2004; Fafunwa, 1990; Keniston, 2001). Keniston's research material originates mainly from India and South East Asia but his findings are highly relevant for an African setting. Adding to this Main (2002) claims that the only way to develop a global information society is to develop software in order to make the content of the Internet meaningful for different user groups with varied cultural backgrounds and different languages. Herman Wasserman (2002) at the University of Stellenbosch in South Africa has written an interesting account on the position and the status of South African languages in connection with new media in South Africa. His position is that language is not only a means of communication, but a cultural identity. "The empowerment of indigenous languages through new technologies could serve as a validation of cultural identities that have either been oppressed during apartheid, or marginalized in the public sphere in the post-apartheid era" (Wasserman, 2002, p. 305).

In South Africa, English is the most common language of teaching and learning⁷ from grade four which has proved to have serious consequences. This is also despite the fact that less than 9% of the total population have English as their mother tongue (Hólmarsdóttir, 2005; Silva, 2006). Extensive research has shown that students gain better and deeper understanding of the subjects when taught in their own mother tongue (Brock-Utne, 2000, , 2002, , 2003; Brock-Utne, Desai, & Qorro, 2003; Desai, 2001, , 2000; Hólmarsdóttir, 2000, , 2005).

In a new report from UNESCO on linguistic diversity on the Internet it is stated that the digital divide can not only be seen as the access to the technology but more important is the issue of language and language diversity (Funredes, 2005). Funredes argues on the

⁷In this study I use the phrase "language of learning and teaching" (LoLT) instead of "medium of instruction" or "language of instruction". When talking about language of instruction it indicates a certain understanding of how teaching and learning takes place. The role of the teacher is more of an instructor where the teacher uses the traditional talk and chalk method. The use of ICT calls for greater participation of the students and greater cooperation between the teacher and student. The use of LoLT does to a greater extent imply to this changed role and has become more widely used in the educational discourse in South Africa after apartheid where emphasis is now on greater participation and different teaching methods compared to those used during the apartheid period (Arthur, 2001).

importance of language when describing use of ICT and very many of the obstacles are found in the use of another language than your own mother-tongue. Not only is much of the software only available in English but English has also become the *lingua franca* of the Internet (Crystal, 2001; Korpela, 2003; Wasserman, 2002; Yano, 2001).

Considering the users of the Internet worldwide and their language in the beginning of 2006 (see table II) one should notice that even though African languages represent 2/3 of languages spoken in the world (Fantognan, 2005) none of them is close to reaching the list of the most used languages on the Internet ("Internet World Statistics", 2005).

Table II	Language	Internet users in millions by language ⁸
1	English	311
2	Chinese	132
3	Japanese	86
4	Spanish	64
5	German	57
6	French	41
7	Korean	34
8	Portuguese	32
9	Italian	29
10	Russian	24

⁸ These numbers were updated on December 31, 2005. The Internet diffusion is the ratio between the total of Internet users speaking a certain language and the total population estimated that speaks the specific language. The definition on how the Internet World Statistics defines the speaker group (whether it is only native speakers or mother tongue speakers or if it includes those having a language as their official language for example like in many African countries) is unfortunately not stated. Example for interpretation from the table could be: there are 311,000,000 English speaking people using the Internet (this number does not include those who speak English fluently as their first foreign language, such as for example Norwegians).

Fantognan further states that African languages appear more as topics of study meaning that they are referred to, used in documentation, description, samples, texts and courses rather than being a means of communication (Fantognan, 2005, pp. 105-106). In addition great deal of documents on African languages are already on the Internet but few of them are written in African languages or by Africans themselves (Fantognan, 2005).

It should still be kept in mind that “before the Internet can really promote multilingualism and multiculturalism in South Africa, the severe inequalities that mark access to the medium need to be overcome... ..this is the challenge to face if the “new media” is to create something new rather than reinforce old divides” (Wasserman, 2002, p. 317).

In South Africa the digital divide is “directly related to material inequalities that are part of the legacy of apartheid and colonialism” (Zegeye & Harris, 2002, p. 250). These factors further shape educational opportunities and access to education in general in South Africa (Abdi, 2001; Campbell, 2001; Crouch, 1996; Fataar, 1998; Murelli, 2002).

Although Fataar (1998) points out that there has been an increase in school attendance and there is a better educational access for all social and ethnic groups in South Africa since 1994, a basic lack of skills to use ICT is still an obstacle. Additionally the quality of education and the situation in schools with regard to equipment, educational level of staff and vision varies greatly in South Africa as elsewhere (Abdi, 2001; Fataar, 1998).

Can we Bridge the Digital Divide?

Even though we can assume that the access to ICT is getting better (according to the number of users), the digital literacy or the skills to use ICT needs greater attention. The conclusion of this paper is that we first of all need to focus on the real challenges that are hindering peoples’ use of the technology. Fulfilling basic needs has to become prerequisite to bridge the different divides discussed in this paper. This includes the view that to be able to bridge the digital divide, one first needs to focus on the real challenges hindering peoples use and motivation to use the technology. Fulfilling basic needs such as bringing access to clean water, electricity, social justice and democracy is the precondition for ever to be able to bridge digital divides. The founding layer in the bridge building is therefore the access to basic

needs. After the real divide has been confronted and recognised one can start focusing on the material divide, opportunity divide, utilization and suitability divides (see figure IV).⁹

Culture – Language - Social Diversity = Suitability Divide
Skills – Knowledge – Support = Utilization Divide
Mentality - Content = Mentality/Opportunity Divide
Hardware – Software = Material Divide


Basic Needs = The Real Divide

Figure IV. The real divide and the different digital divides

Despite different approaches to the concept, it is clear that access and use of ICT is not the norm in Africa (Kuttan & Peters, 2003; Raubenheimer & van Niekerk, 2002; Wilson & Wong, 2003). Kuttan and Peters (2003) even talk about the situation in Africa as being a digital abyss rather than a digital divide. The focus in this paper has been to look at access issues and to recognise other divides and barriers that influence the use of ICT. The conclusion reached here is that bridging the digital divide is not only a matter of having or gaining access to the Internet, but is just as much a question of underlying social, political and economic situation in respectable countries. The Digital Divide is closely related to social inequality. Spenneman states in his research on the digital divide in the Pacific Islands that “apart from cultural attitudes, race/ethnicity does not seem to be a variable on its own, both rather a product of ethnic marginalization in education and income, both of which are factors in their own right” (Spenneman, 2004, p. 47).

Thus, instead of asking if we should introduce ICT which is often the question when discussing ICT in developing countries we should rather focus on *how* to introduce the technology to all layers of society. As Warshauer states “...*the stratification that does exist regarding access to online information has very little to do with the Internet per se, but has everything to do with political, economic, institutional, cultural, and linguistic contexts that shape the meaning of the Internet in people’s lives. Thus the inequality that does exist is*

⁹Unfortunately there will always be areas (at least in the foreseeable future) that lack access to basic needs. This is not to say that we have to wait for the basic needs to be universally fulfilled before we can start working on the different divides. In a way this refers to the discussion on whether or not developing countries can leapfrog some of the technological developments. Steinmueller defines leapfrogging as “bypassing stages in capacity building or investment through which countries were previously required to pass during the process of economic development” (Steinmueller, 2001, p. 2). I do see it as possible to identify the importance of basic needs together with working on fulfilling them, in conjunction with working on bridging the digital divide.

social, not digital” (Warschauer, 2003, p. 297). ICT can therefore be seen as *potentially important* in all those aspects. The greatest challenge remains, and that is to dismantle the social, cultural and the linguistic barriers regarding use of computers and Internet.

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