

Strategies For Mitigating Second Level Digital Divide

Ronald Chikati, Nkosinathi Mpfu

Abstract: Developing countries are massively weighed down by the influence of digital divide. Soon after the world summit on forming millennium goals, there was a scramble for Information communication Technology (ICT) acquisitions and installations by many countries throughout the world. Coupled with huge reduction in the prices of the paraphernalia of technology, the concept was well adopted and to some extent well executed by many countries. In the rush to deal with access (first level) digital divide, most developing countries did not pick it early enough that by arresting one problem, another one was spawned. Today, it is more than a decade and no convincing evidence is there to show that the national endeavours benefited the majority. Perhaps efforts are thwarted by the competency (second level) digital divide. It is from this standpoint that we propose strategies for mitigating this new spectacle of digital divide.

Keywords: digital divide, second level digital divide, capability digital divide, access digital divide

1.0 Introduction

A lot about the access level phase of digital divide has been written by several authors [1], [2]. The previous work focussed predominantly on closing the digital gap through unveiling the information communication technologies (ICTs) including helping communities with Internet connectivity. Further researches have also pointed out that the digital divide gap is a social order that emanates from disparities and technological access variability between individuals, communities, schools, countries and regions. At least at no given time would there be equitable distribution of technologies among these categories, although of course the intention has been to minimise rather than to totally obliterate such digital gaps. For some reasons the rapid efforts to gap the digital divide has further widened the digital divide between those who have been using computers in the past and those who meet computers for the first time at school, college or the workplace. As a result the attempt to use ICTs to curb social ills like illiteracy, poverty and unemployment in most developing countries remains an elusive dream; some kind of a mouse and a cat game. The aim of this paper is to propose strategies that can be adopted to mitigate the second level digital divide. We will explore the phases of digital divide discussed by some scholars and then move on to give examples and suggest recommendations that could be used by many developing countries to mitigate the second level digital divide.

2.0 Digital divide framework

The work of Wei, *et al* [3] on conceptualising and testing a social cognitive model of the digital divide, has established three levels of digital divide.

2.1 Digital Access Divide

According to the research, the digital access divide is referred to as the first-level digital divide. In this case, they maintained that this level of divide is the one that reveals disparities of ICTs availability among individuals, nations, regions and or continents. This is to do with lack of or no physical access to ICTs and technologies like the Internet. The first level digital divide is what many researchers, educators and policy-makers have been dealing with in a bid to make available computers and broadband Internet connectivity to communities and schools everywhere globally [6], [7], [8], [9], [2].

2.2 The Capability digital divide

According to Wei, *et al*, [3], the second level digital divide, is the capability or competency divide. This type of a divide is brought about by the access divide. Thus where there are differentials in the provisioning of the physical ICT infrastructure to individuals, there is a high probability that such individuals are not skilled or competent enough to have optimal usage of the IT infrastructure. This suggests that there exists a strong positive correlation between those who have had early exposure to ICT and the way they put them to use in future. The research by [4] on the digital divide and the education value chain indicated that a disparity in the access and use of ICTs within the education value chain will result in the differences in the outcomes between the digitally included and the digitally excluded. In fact between these dichotomies of users, the digital divide gap widens with time if no mitigation interventions are cued in. This view is shared by Wilson, [14] who further noted that merely having access does not mean that a digital divide has been solved because a divide remains in the capacity to effectively use the technology [for example the Internet]. There is more to digital divide than would physical access to technology would solve [5]. The concept of second level digital divide and how to address it is central in achieving and deriving maximum benefits and opportunities from the uptake and usage of ICT. The millennium goal of universal access to ICT for poverty reduction in many developing countries could then be holistically achieved and efforts and investments in ICTs by the governments will begin to redeem positive results.

2.3 The Digital Outcome divide

The third level of digital divide as categorised by [3] is the digital outcome divide. This level speaks of the inequality of outcomes of exploiting ICT arising from the capability digital divide and other contextual factors. For example the quality of information that one can download from the Internet depends on the navigation skills set of the Internet user. As a result differences in web use skills would allow us to distinguish how different kinds of people are able to take advantage of the medium [Internet] in varying ways [12]. Unlike Wei, *et al*, [3], other researchers like DiMaggio and Hargittai [13] suggested five dimensions along which divides may exist. However, regardless of the order of the divides, all the researchers agree that the capability

(competency or Skill) digital divide determines one's ability and proficiency to use the medium (ICT) effectively. This second level of the digital divide is a vital component for consideration in order to arrest the dilemma of digital divide. Wilson [14] echoed this sentiment when he argued that we cannot talk about the Internet's effect on political participation if a user does not possess the skills to find political information. Thus the Internet by no means could it prove to be a useful link between the government and citizens if people are unable to find official documents online. This brings us back to the same issue that mere structural measures of physical access to ICTs alone does not close the digital divide but this has to be augmented with skills impartation or at least empowering ICT users with a coterie of significant ICT skills for the majority of individuals.

3.0 It is Capability divide and not Access Divide

Policy makers must have noted by now that as access increased, other aspects of the digital divide have surfaced, e.g., computer literacy, health literacy, and mismatch between desired and available e-health services. Providing ICT equipment to schools or teachers will not make a difference (BERA). In 2005, we visited some electrified rural school in Zimbabwe and as of that time, the school had just acquired computers for the school. Some of the computers had come to the school as a generous donation from the government to address the digital divide between urban schools and rural schools while others were donated by the former students (alumni) of the school. What saddened us was to see a computer laboratory with computers covered from dust with cloth materials. Our inquiry revealed that the school had no competent computer teacher and access to the lab by students was prohibited. Furthermore, our research in Botswana [5] also indicated that most of the public schools with computers by 2009, they had one or no skilled computer teacher and as a result no meaningful computing skills were imparted to the pupils who were mostly allocated one (1) hour period per week to use the computers. These typical examples are just the tip of an iceberg when you compare the gap between access level digital divide and the capability-second level digital divide. Probably, there are many similar cases out there in most of the developing countries. It must be stated in uncertain terms that digital divide has now largely shifted from access to computers or ICTs acquisition to the second divide: between those people who are lost in the digital environment and those who have the skills to navigate efficiently and effectively through all the information now available to them through digital technologies. It is up to us – concerned policy makers, educators and parents – to ensure that our children are not left behind on the analog side of the digital divide [15]

4.0 Mitigating Capability Divide

As lofty buildings were built brick by brick, so should be the implementation of an ICT skills action plan if developing countries are to create a sustainably productive ICT initiative. The problem could be better addressed using a bottom-up approach. This would entail training pupils from kindergarten and supporting them up to tertiary level of education and then migrate the effort to the workplaces.

4.1 Computers to be introduced early in schools

Since most of the factors that result in second level digital divide originate from the access divide, adoption of concepts like the *one laptop per child (OLPC)*. Just like the origin OLPC concept that aimed at developing low-cost computers meant for children, there is need for a government to be in league with manufacturers of low cost computers for children. For instance the Aakash tablet was sold in India at a relative low cost of \$35 to enhance computer awareness to pupils. Such laptops or tablets must be able to run applications like games, maths, puzzles, language and spelling and to support simple search facilities be it of simple words or geographical locations. Such an exposure could develop inert ICT skills in the pupils; skills that would be fully developed later.

4.2 Train the trainer

One major hurdle faced by most developing nations is having the skilled personnel to impart the right ICT skills to the learners. Up to today, ICTs are still regarded as a luxury [3]. It takes a fully committed government to first change people's mind-set. One way of doing this is to initiate programmes like train the trainer, in which case ICT professionals are called in to train personnel who are supposed to champion ICT skill delivery to new learners. All student teachers in training colleges may learn fundamentals of ICT skills as part of their training. By the time they graduate, these teachers are able to teach computer/ICT basics. Such an approach requires an overhaul of the teacher training curriculum to infuse learning of information technology. This approach would empower every teacher and this is one sustainable approach to ensure proper ICT skills impartation in schools.

4.3 Adopt a School strategy

Botswana has come up with an innovative initiative that could be adopted by many developing countries in their bid to bridge the self-efficacy divide. This strategy is the ministry of education initiative that looks for partnerships with individuals, private companies, non-governmental organisation (NGOs) in assisting schools as a way of supporting classroom instruction. Generally the business community could partner with government, to furnish schools with computers, laboratories, maintenance of buildings, provision of air conditioning, paving of sporting grounds and provision of transport especially to villages such as Satau, Parakarungu and Pandamatenga (Venson-Moitoi cited in [16]). With regard to the sharing of ICT skills with the early adopters, this broad concept has seen tertiary graduates with Information Technology, computer science, library Information science and computer electronics and engineering qualifications volunteering to mentor youngsters at primary and secondary schools. Pupils are taught various skills like web development, database design, working with spreadsheets, word processing, presentations, internet usage and so on. In Botswana, only urban and peri-urban schools have benefited from this project. If the initiative is well-formalised it could serve as a temporary and permanent solution to the ICT skills shortage experienced by many developing nations. Most of graduates with IT-related qualifications with a little help from the government to sustain their upkeep and sustain their

travel expenses could bring massive revolution in the uptake and assimilation of ICT skills in the schools.

4.4 Aligning ICT to Individual choices

Another important area that needs a thorough scrutiny is how to align ICTs to the needs of different individuals, organisations or communities. ICTs are not only limited to the use of computers but rather there are several kinds of ICTs from which individuals must have some kind of informed choices to make. The government or policy makers must enable all individuals to make informed and empowered choices about the uses of ICTs whilst ensuring these individuals have ready access to the resources required to enable them to act on these choices [10]. With more nomadic ICT users and the high prevalence of the mobile phones today, alongside the basic skills of numeracy and literacy, individuals are required to develop different forms of information and technological literacies [10]. In the light of this discussion, we argue therefore that when it comes to ICT policy implementation, an all-stakeholder engagement is desirable and such noble undertakings must not be thrust on people for political manipulation to gain votes. Many African governments have come up with different forms of ICT donations to gain favour of the electorate and this only happens during the campaigning periods. This means the whole project is misdirected and just as anyone would guess right, a total disaster. Such wrong agendas have always magnified failure rate statistics of many a government projects. There is need to consider how skills will be disseminated, social and technical support with respect to hardware and software, maintenance and relevance of content and accessibility of services. All these issues and many more must be oriented to individual needs, otherwise the full potential of ICTs will never be realised.

4.5 Promote ICT related courses at tertiary level

In the 21st century and beyond, human capacity building in ICTs is to be seen as a way of empowering the country's people. This will stimulate participation by all and sundry at community, provincial, national, regional and global scale. This may also enable people to access easily health services, e-government services, agricultural information as well as promoting Small, Medium and Micro-Enterprises (SMMEs) while taking into account relevant market and cultural contexts. This holistic approach will pay dividends if and only if ICT skills are packaged in a manner that will benefit the greatest majority. Thus promotion of ICT related courses must be a catalytic exercise that must be advocated for by the policy makers, educators, government, public and private sectors and the parents. Tertiary institutions must not make it difficult for students to enrol in computer science, Information science and engineering programmes since these are fields equip most students with higher order ICT skills. This means Universities; vocational colleges must introduce courses in IT related areas to benefit most of the people. At the same time these tertiary institutions must reduce and relax programme entry requirements to encourage many students to attain ICT skills needed for the 21st century economies. This strategy is handy in that the present generation use laptops, pagers, instant messaging, the Internet, blogs, social networks- twitter, Facebook, podcast, webinars, teleconference and

the like. Ideally every aspect of their lives is affected or dictated by ICTs. Life today is different from yesterdays.

4.6 Catering for the people with special needs

The mantra about universal access to ICTs can only be achieved if digital inclusivity takes centre stage. Politicians like policy makers must ensure that ICT infrastructure is put in place to benefit the visually impaired, those with hearing challenges, the physically challenged, senior citizens, girls and the marginalised groups. (Mechanisms et al. [11] advocates for building ICT capacity for all and ensuring confidence in the use of ICTs by all including the youth, old, indigenous peoples, and women, remote and rural communities. ICT skills must be packaged in a customised way to fit the intended consumers. This calls for a collective effort by all stakeholders together with professional with different ICT expertise to champion such programmes.

4.7 Import Scarce ICT skills

In developing countries where ICT skills remain a challenge that cannot be solved through internal skills supply base, there is need to import such scarce skills from other countries. The migrants could be ICT teachers, Lecturers, network engineers, software developers, telecommunication engineers and many more ICT technical professionals. Countries could lower their visa and entry requirements for people with such ICT skills so that many such professionals are attracted to migrate to these countries. Such an exercise will benefit many people through cross-fertilisation of ICT skills and could result in new and innovative ways of using ICTs. The ultimate outcome could be more active economic participation by the citizenry and high economic productivity.

5.0 Recommendations and Conclusion

Today we are all living witnesses of a runaway world of ever-changing technology; a world in which every facet of life is dictated by technology. In such a world, developing world must geared up their game by first realising that digital divide does not only imply disparities in universal access to ICTs (first level digital divide) but that there has been an emergence of the second level digital divide that has shown conspicuous gaps in ICT usage capability differentials among people with different previous ICTs access levels. That having been said, governments of developing countries must consider numerous strategies of mitigating this new type of digital divide that stand to frustrate many government efforts poised to accrue ICT opportunities and to promote greater participation to the wellbeing of the economy by many of the citizens. The most emphatic focal point that can breed quick successes is to consider use of ICTs in educational settings and how ICTs could be integrated into the curriculum. If this is going to be the way forward then it should start by changing the way new teachers must be trained in colleges and universities. The skills instilled in them must be brought to the classrooms at kindergarten level through to tertiary institution. Only then would the society be in a position to be equipped with essential ICTs skills that can benefit individuals as well as the nation at large. Beyond this level, a country could then be in a position to take stock of the return on ICT investments. It has been argued that an all-stakeholder consultative forum is a necessary ingredient for

the successful implementation ICT policy and national agenda. We might be able to spend our way out of the first digital divide but we are going to have to talk about our way out of the second level digital divide. Without such a dialogue, the regulations will come but they will be ill-informed; deployments will occur but will be recklessly optimistic and technological developments will continue but they will be ignored or ineffective [16]. By mitigating the second divide, you are ensuring everyone to participate and contribute for the common good of the society. Further research must evaluate the gains that could be derived from successful bridging of the second level digital divide.

6.0 References

- [1]. Anon. The Next Digital Divide. , p.7993, 2004.
- [2]. Mporfu, N and Chikati, R. An Assessment Of The Impact Of High School Digital Divide To Students Performance At Tertiary Education In Botswana. International Journal of Scientific and Technology Research , 2(9), pp 68-72, 2013.
- [3]. Wei, *et al.* On conceptualising and testing a social cognitive model of the digital divide, Information Systems Research, 22(1), 2011
- [4]. Mporfu, N. & Chikati, R. Digital Divide And The Education Value Chain. International Journal of Scientific and Technology Research , 2(10), pp.87–91, 2013.
- [5]. Chikati, R., et al. There is more to bridging digital divide than physical access to ICTs: Advocacy for Botswana, 2 (8), pp267-272, 2013
- [6]. Charleson, D., Bridging the digital divide: Enhancing empowerment and social capital, 3(2), 2012
- [7]. Mattern, F., Staake, T. & Weiss, M. ICT for Green – How Computers Can Help Us to Conserve Energy, 2010.
- [8]. Natriello, G. Bridging the Second Digital Divide: What Can Sociologists of Education Contribute?, (July 2001), 2006
- [9]. Riggins, F.J. The Digital Divide: Current and Future Research Directions, pp.1–54, 2005
- [10]. Ballard, C. & Farrell, D.M., Dimensional Modeling: In a Business Dimensional modeling for easier data performance, 2006.
- [11]. Mechanisms, F. et al. Tunis agenda for the information society 6(November), pp.1–20, 2005
- [12]. Hargittai, E. Second-Level Digital Divide: Differences in People's Online Skills, First Monday Journal on the Internet, 7(4), 2002
- [13]. DiMaggio, P. and Hargittai, E. "From the 'digital divide' to 'digital inequality': Studying Internet use as penetration increases." Princeton: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University, 2001
- [14]. Wilson, E. "Briefing the President," at <http://www.internetpolicy.org/briefing/ErnestWilson0700.html>, 2000, accessed 19 November 2013
- [15]. Cassandra, D. "Version Comparison: OECD releases results from first international assessment of digital reading competencies", OECD INSIGHTS SERIES, 2011.
- [16]. Chube, L. "Adopt-A-School initiative launch," at <http://www.dailynews.gov.bw/mobile/news-details.php?nid=1057&flag=current> 2013, accessed 17 November 2013