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Diversity, Disability, and Geographic Digital Divide

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Abstract

The phenomenon called digital divide was the focus of this paper. Diversity, disability, and geographical digital divide were relevant to this collaborative project. An extensive review of the literature was conducted for the completion of this project. The evidence for the digital divide in terms of race, level of education, and gender in the United States is presented. Digital divide as it affects individuals with disabilities was delineated. The geographical digital divide experienced especially by people on the continent of Africa was clearly expounded. The progress made in each of these areas was identified and well articulated. The paper concluded that this digital divide has raised both national and international concerns needing global collaborations among institutions of higher learning, national governments, and financial institutions in order to close the gap. Narrowing if not closing the gap would enable many people on the globe to be well informed to make prudent contributions to the development and improvement of global knowledge and economy. The attainment of this crucial goal is also germane to the advancement of global higher education to an equitable level.

Diversity, Disability, and Geographic Digital Divide

Research has indicated a large gap between those who do and those that do not have access to technology. The digital divide is both a national and an international concern. Although some have painted a picture that technology has opened doors of opportunities for learning, the fact is that the majority of the population on the planet does not have access to this technology. Chandra (2002) explained:

If access to the WWW is to be defined as a criterion for joining the information age, then about 2% of the world's population of 6 billion people has gained access to it by the year 2000. Indeed, the Internet may be changing everything for those who use it, but it is still doing nothing for 19 out of 20 people on our planet. (p. 235).

The inequities caused by the divide are evident nationally and internationally. Dragulanescu (2002) quoted a United Nations Administrator as saying, "The information and technology gap, and related inequities between industrialized and developing countries are widening: a new type of poverty – information poverty – looms," (p. 140). Dragulanescu (2002) indicated that while in the United States one computer is shared by only two people, in Africa one computer is shared by 6000 people. According to Caverly and MacDonald (2002), about 429 million people are online and this represents only about 6% of the world's population. Furthermore, 41% of the 429 million online users are from either the United States or Canada. Clearly, the digital divide has become an international concern as well.

Burgstahler (2003) has also made the case for the effects of this digital divide on the disabled members of the human race. He said that though computer technology has allowed people with disabilities to function relatively independently, they are still stymied by a number of barriers to computer use.

In light of the above, this paper has delineated the concept of the digital divide and expounded on those it directly affects. The evidence of digital divide in terms of race, educational level, and gender in the United States is presented. Digital divide as it affects people with disabilities is clearly outlined in this paper. Geographical digital divide especially for the African Continent and the progress made thus far, are discussed. Finally, the paper is concluded with recommendations for national, transnational, and global collaborations by governments, institutions of higher learning, and stakeholders to narrow this gap. Now the concept of the digital divide is briefly defined.

The Digital Divide as a Construct

In theory, the rapid growth of online programs has given the opportunity for students with myriad backgrounds to improve their educational qualifications and career enhancement. However, the literature reveals that technology is not accessible to all. This phenomenon known as the digital divide is a huge concern in the world today. “The Divide speaks to the concrete and symbolic distance between those who enjoy access to, and familiarity with, the immense potential of technology, and those who do not”(Munoz, 2002, p. 20). Pearson (2002 p. 15) described the divide as, “the separation between those who have access to and can effectively use technology and those who do and cannot.” More attention should therefore, be given to the problem as the disparities in the digital divide increase and only continue to get worst if nothing is done. The case of how it is permeating in the United States culture is explicated.

Digital Divide by Race, Educational Level, and Gender in the U. S.

The inequities in technology have become a civil rights issue both nationally and internationally (Carvin, 2000):

The digital divide is one of the most important civil rights issues facing our modern information economy. As telecommunications increasingly entwines itself with education, social, financial, and employment opportunities, those communities lacking access will find themselves falling further behind the rest of society, (p. 56).

Political leaders have begun using the digital divide as a debate platform. President Clinton is quoted by Benedetto (2000) as saying:

If you have seen what technology has done for you and for this economy, closing the digital divide is one of the most important things we can do to have the quickest results in alleviating the kind of poverty that is inexcusable in the kind of economy we are experiencing today. (p.13A).

Race

Consistent throughout the literature is the fact that race, gender, educational level, and socio-economic status are determinant factors in whether or not someone had access to technology. With regards to race being a factor, Pearson (2002) noted the disparities in the divide that still exists today:

The 1998 gaps between whites and minority groups, with regard to computer ownership, still exist today. Between African Americans and Whites, there was a 21.1 percentage point difference from 1998 where as, there is a 23.1-point difference today. For Hispanics, the difference was 23.4 in 1998 and is 22.0 today. (p. 16).

Carvin (2000) indicated that in the U.S., households earning over \$75,000 are 20 times more likely to have home Internet access than those with income levels lower than that. Much of the research indicated that socio-economic status and race were two factors that when combined contributed largely to whether a person had access to technology or not. “There are large

disparities between the access opportunities of the rich vs. poor and ethnic majority vs. ethnic minority” (Pearson, 2002, p. 15). “Poor and minority families are less likely than other families to have access to computers or the Internet, creating a technology gap between information haves and information have-nots” (Attewell, 2001, p. 252).

Some of the research also indicated that the divide is really symptomatic of a much larger social problem. On the other hand, (Light, 2001, p. 709) stated “However, public debate has addressed the digital divide as a technical issue rather than as a reflection of broader social problems.” In the same token, (Carvin, 2000, p. 57) has indicated that “Technology access is only one small piece of a much larger puzzle, a puzzle that if solved might help raise the quality of life for millions of people.”

Light (2001) put the issues around the digital divide in historical perspectives, “From electricity to the telephone and the automobile, most technologies did not enter U.S. society equitably,” (p. 711). Clearly, the digital divide is a concern, “Technology and equity are not inevitable partners,” (Munoz, 2002, p. 21) and to better understand its impact on poverty, Chandra (2002) defined information poverty in this way:

The result of poverty, social inequality, corrupt systems of governance, and the hierarchical model of segregating the rich from the poor, the educated from the illiterate, and from building systems and services based on unfounded beliefs that they would be most in use by those at the top of the pyramid. (p. 245).

Education

In the U.S., race and education are intertwined. Compared to Whites, African Americans, Latinos, Native Americans, and some Southeast Asian Americans like Vietnamese are currently underrepresented in higher education. The U.S. Department of Commerce 2002

Report indicated that 65% of college graduates had online access while only 12% of individuals with high school diplomas or less had online access, Caverly and MacDonald (2002). Angileo (2002) found that Latinos are more disadvantaged in online courses compared to Whites. Palloff and Pratt (2003) have also articulated that rural and inner city African Americans and Latinos have limited computers and access to the Internet. These authors and Smith (2004) cogently argued that minority students are often not included in the learning process because online course instructors tend to ignore their learning styles and what is relevant to them. To this end, they emphasized the need for e-learning course developers to make allowance for different learning styles. Sleeter and Tettegah (2002) found that technology and multicultural education that engages students around cultural artifacts such as music and ethnic portals may bridge access to language, literacy, math, science, and the arts.

Gender

In addition to race, socio-economic status, and educational level, gender is also a factor in the digital divide. Women are underrepresented in the computer technology fields. Gorski (2002) stated that although women make up over 50% of the online population, only 27% of all Bachelor's-level computer science degrees have been awarded to women. To make matters worst, this is actually a 10% decrease since 1984. It has also been observed that this phenomenon known as digital divide is further complicated when the learners are individuals with disabilities.

Online Course Accessibility by Individuals with Disabilities

Definition and Scope of Disability

In the year 2002, approximately 7.7 percent of civilian, non-institutionalized, men and women, ages 18-64 in the United States reported a disability. In other words, 13,474,000 out of

174,896,000 (or about one in 13) civilian, non-institutionalized, men and women, ages 18-64 in the United States reported a disability (Houtenville, 2005). In post-secondary education, the percentage of full-time college freshmen with disabilities has increased significantly in recent decades (American Council of Education, 2000). The report revealed that in 1988, nine percent of all full time freshmen had at least one type of disability. In 1978, only three percent reported that they had a disability.

The term accessibility is used to describe whether a user with disability is able to use computer to access information. Web accessibility is “the process of ensuring that users are able to use a Web resource, such as a class Web site without further modification, regardless of abilities and disabilities” (Accessibility in Distance Education, 2005, p. 2). Disability is a broad concept that has many categories. A person with a disability usually has a physical or mental impairment that may limit one of more major life activities (Accessibility in Distance Education, 2005). Mobility, visual, hearing, and speech impairments are examples of disabilities that can affect individuals’ access to information. Foley and Regan (2002) noted that the challenge of accessibility is faced not only by the users (students and instructors with disabilities); it is also faced by the designers who are responsible to remove the barriers that prevent users from accessing the information effectively.

Individuals with mobility impairments may have limited movement and face difficulties using a standard keyboard and mouse for typing and navigating electronic media. They also lack the fine motor skills required to select small buttons on the screen. It may be difficult for them to press multiple keys simultaneously and to input via voice devices because of the control problem of facial muscles (Deng, 2005). As a result, they may not be able to access Web content that

requires mouse movement (Deng, 2005) and participate effectively in real time life chat (Accessibility in Distance Education, 2005).

Students who are blind depend on screen reader and Braille software to access information. They may not understand the organization of a Web page well enough to navigate it efficiently. Since screen readers and Braille software can only access electronic text, they cannot access the images presented within contents (Foley & Regan, 2005). Students with limited and blurred vision can only see the computer screen to certain extent at a time. Consequently, cluttered Web pages that are not consistent from page to page can make navigating Web sites and understanding its contents difficult (Burgstahler, 2002c). Locating the important information in online classroom is often difficult for these students because they cannot just glance over information (Bush, 2005).

Although accessing Internet resources does not require hearing ability, people who are deaf or hard of hearing still face difficulties when the sites require them to use audio output that does not provide text captioning. Consequently, online students who have hearing impairment may not be able to participate in audio or video conferencing sessions unless sign language interpreters are provided (Burgstahler, 2002c). Student with speech impairment face similar challenges experienced by hearing impaired students. They may not participate effectively in telephone and video conferencing. However, they still can use email and chat-software as a medium of communication (Accessibility in Distance Education, 2005).

Learning disabilities is another form of disability that can also pose challenges for online students. A survey conducted by Cooperative Institutional Research Program (CIRP) shows that learning disability is the highest percentage disability category reported among college freshmen. In 1988, 16% of all college freshmen with disabilities were those that reported having a learning

disability but by 2000, the percentage rose to 40% (Henderson, 2001). Learning disabilities can be caused by other kinds of disabilities including hearing and mobility impairments. Attention Deficit Disorder (ADD) and Attention Deficit Hyperactive Disorder (ADHD) are examples of disorders that can affect students' learning abilities. Students with learning disabilities may face difficulty understanding Web sites when the information is cluttered, when the content is not worded clearly or when difficult vocabulary is employed. When the layout of the screen changes from one page to the next, the navigating scheme is not simple and intuitive (Accessibility in Distance Education, 2005).

Barriers and Accessibility

According to Burgstahler (2003), the widespread use of computing technology is helping these students to handle a wide range of activities independently. The rapid development of technology has also given them access to networking, multimedia, and telecommunications. However, simple access to technology is not enough if their options for taking courses and pursuing careers are limited (Burgstahler, 2003). Kinash, Crichton, and Kim-Rupnow (2004) reviewed the literature from 2000-2003 on online learning and disability. They noted that people with disabilities are among the least considered in the educational context of online learning. A report by US Department of Commerce (1999) revealed that there is still a large disparity between those who have access to information technology and those who do not.

Even people with disabilities who have access to technology also become subjects of the digital divide. They continue to experience a variety of barriers to computer use (Burgstahler, 2003). Waddell and Urban (2001) identified inaccessible Web sites, software incompatibility with adaptive devices, and voice automated systems inaccessible to adaptive telephones as some of the barriers. According to (Burgstahler, 2002b) they are on the wrong side of a "second

digital divide.” Individuals who are on the wrong side of the digital divide include students and instructors with disabilities in online distance education. Even though there are many forms of assistive technology devices, research shows that many online distance education programs still present barriers to these students.

Rowland (2000) reported that in a random sample of colleges, universities and online institutions Web pages (n= 400), only 22% of the home pages are accessible. In a follow up study involving 124 online distance education Web pages, Rowland reported that only 24% of them were free from major access barriers. Schmetzke (2002) investigated the accessibility of distance education Websites by looking into two types of Web pages: distance education providers Web pages and distance learning organizations Web pages. The study revealed that for the first type, only 15.1% of the 219 Web pages of distance learning providers are free from major accessibility problems. A further look at pages linked to the 219 Web pages (which consist of 3,366 pages) showed that only 23.3% were accessible. The major accessibility issues detected included images without alternative text (81%) and image map hotspots without alternative text (16%). For the second type, the study revealed that only one of twelve distance learning organizations homepages was accessible. A comprehensive look at pages linked to the home pages showed that only 18% passed the accessibility check.

Making Online Education Accessible

With the growing number of online distance education, it is important to make sure that the education is also accessible to individuals with disabilities. Foley and Regan (2002) pointed out that there are a number of reasons to provide accessible technology. First, accessibility is the right thing to do because it “represents an important step towards independence for individuals with disabilities” (p.4.). Providing accessible information fulfills the need of computer users

with disabilities rather than forcing them to conform to the technology. Second, assistive technology will also benefit non-disabled and aging learners who may incur disabilities later in their lives. Third, accessibility allows for the creation of innovative technology.

Accessibility also benefits individual with disabilities who do not want to disclose their status. Lance (2002), an online faculty with cerebral palsy noted that accessible online education is a perfect venue to teach because he is free from any constraints of his disability. He also stated that the online world gives him enough time to interact without the hindrance of his speech and mobility impairments. Similar to faculty, students with disabilities also have the option not to disclose their status. The option of being anonymous will help individuals with disabilities to communicate more freely and effectively with other people in an online classroom. It is therefore imperative to work on removing barriers to accessibility.

One way to remove barriers to accessibility is by providing assistive technology. Examples of assistive technologies include taped text, note takers, screen readers, video text displays, television enlargers, closed-caption decoders, electronic readers, and voice synthesizers (Opitz, 2002). However, assistive technology alone does not remove barriers especially in an area where technological changes occur frequently (Burgstahler, 2002). Understanding the laws related to accessibility and the effects of digital divide, is an important step to solving the problem (Lu, 2002). These can be achieved through collaboration between departments in higher education institutions. Faculty, campus disabled student services, distance learning programs, course designers, and technology services support staff (McCann, 2004), students with disabilities, and libraries themselves (Burgstahler, 2002b) should collaborate to create solutions to the problem of designing accessible Web sites. It is difficult to provide an excellent service at a distance if each department works individually. For example, disabled student services may

have experts in ADA, but they may not be familiar with distance learning pedagogy and student service challenges. Distance learning staff may have experience in distance education but they are not formally trained in disability areas. Technology services support staff may fully be aware of the constant technological changes and know how to provide universal design that is usable by all people but they are usually not familiar with teaching and learning techniques especially in distance education. By working together, they will provide resources in a central location to facilitate contact among students, faculty, and staff; thus helping the institution in promoting distance learning disability awareness on campus.

The creation of written guidelines is also important to remove digital barriers (Yu, 2002). The guidelines and policies will guarantee that higher education institutions only offer programs that meet the universal design principles. The policies should be integrated into Web design processes (Yu, 2002) and standard curriculum within academic degree programs (Burgstahler, 2002b) to ensure that the goal of accessibility for all is achieved. If the institutions already have policies in place, those policies should be reviewed periodically to ensure that the content meet the constant technological changes (Yu, 2002). Universal design that is usable by all people will provide equal learning opportunities to students and instructors with disabilities and help them to fully overcome digital barriers and participate effectively in the Web environment.

Another step in making distance education accessible is, by hiring specialized academic advisors who are aware of distance learning programs and course requirement (McCann, 2004). Their responsibilities include the coordination of development of appropriate assessment and teaching styles to accommodate disabilities. Finally, accessibility is mandated by law as stated in Section 508 of the Rehabilitation Act Amendments of 1998 and the American with Disabilities Act of 1990. In the same token, digital divide based on geographic location is a

serious problem because like a physical, mental, or learning disability, being in a certain geographic region of the world can stymie one's access to the Internet and its technologies needed to effectively use the World Wide Web. Africa is geographically facing a digital divide and this paper has expounded the problems and progress below.

The State of Digital Divide for Africa

The Challenges and Need for Access

In the early 1960s, the continent of Africa only had about six post secondary schools or tertiary educational institutions. Though this number has increased to over 250 universities, colleges, and community/polytechnic colleges, majority of them are traditional teaching mode institutions. They also lack enough spaces to accommodate all qualified candidates for higher education in Africa. This has resulted into fierce competition for access to college education. In other words, only five percent of the students eligible for college education have been admitted due to lack of space and the destruction of facilities in recent years by conflicts in many regions of Africa. The overwhelming demand for access to tertiary education is partly due to the fact that over 75% of Africa's population is made up of people ages 45 and younger while only 4% of the population comprises persons 65 years and older (Ekhaguere, 1999).

An estimated 12 million Africans would be seeking admission to higher educational institutions every year in the new millennium (Ekhaguere, 1999). The World Bank in a major policy study called Education in Sub-Saharan Africa, singled out distance education programs for the expansion of secondary and tertiary educational services to be at lower unit costs than conventional method of delivery in African countries (World Bank, 1988). A number of African experts have argued that for Africa to be a part of the global knowledge and economy, traditional tertiary institutions or the traditional long distance delivery methods like radio broadcast, written

materials, audio cassettes, and videos will not be able to meet this demand (Magagula, 2003; Ndeto Ivala, 2000; Pityana, 2004). In other words, distance education, which is the single most solution for higher education in Africa, should be delivered through Internet technologies that can accommodate all of the above methods of long distance education delivery at a faster pace and on a massive level. Therefore, investment in the Internet and Web technologies needs to be strengthened by all African nations in order to give all qualified post secondary students access to higher education. According to Pityana (2004), technology can help bridge the divide of space and time and thus access information that would have been unavailable in some contexts. He however argued that there is a digital divide among the haves and the have-nots. He indicated that developing countries have not been able to access knowledge and the information society because their social circumstances such civil conflicts, one-party regimes, among others have hidden this opportunity from them.

Farrell (1999) asserted that with the exception of Egypt and the Republic of South Africa, the lack of Internet connectivity and the lack of experts for online teaching in sub-Saharan Africa are major constraints to providing higher education through this arena. This authored attributed the problem to the lack of money to purchase computers, software, modems, or to maintain and replace software and hardware. Though Africa has 12% of the world's population, it only has 2% of the global telephone network ratio (Darkwa & Mazibuko, 2000; Marcelle, 1998).

Aleobua (1999) has noted some interesting disparities for existing telephone network among African countries. He asserted that among the world's most sophisticated national networks, are those found in Botswana and Rwanda where 100% of the main telephone lines are digital (compared with 49.5% in the United States of America) while other African nations like Madagascar and Uganda have poor national links.

Ndeto Ivala (2000) stated that Internet connections in developing countries are limited to urban areas and the majority of the population in the rural areas is without access. In Africa, South Africa for example, accounted for 48,000 out of the 50, 000 Internet hosts in 1994. Many people have access to the basic Internet service like email than they have access to the World Wide Web. In developing countries like in Africa, full Internet connection is either not available or is not capable to handle large volume of information needed to use the Web.

Ndeto Ivala (2000) argued that though the Internet and its related technologies clearly offer opportunity to traditional constraints on new trends in education, developing countries on the other hand face a number of constraints in accessing the Internet. They include lack of adequate telecommunications, high Internet access charges, high cost of computers and telecommunication equipment, a severe shortage of skilled technology personnel, and the associated regulatory environment that controls access. Jensen (1998) stated that the average cost of low volume Internet account in Africa is US \$50.00 a month and this is often just limited to email access. It costs about US \$75.00 total to have dial-up Internet access compared to \$10.00 in the U.S. and US\$15.00 in England. She claimed that the average teledensity (number of telephone lines per 100 persons) is 1.5 in the developing countries and in very poor countries like Liberia, Guinea, Niger, Somalia, and Afghanistan; it is 0.0002 or one telephone line for every 500,000 people. In the U.S., the teledensity is 65 or one telephone line for every two persons and it is 45 in Europe. Ndeto Ivala (2000) has asserted that Africa has the least number of telephone lines per capita in the world; the rural areas virtually have no access to telephones. The existing African telecommunications infrastructure is in very poor condition according to this author. Based on these statistics, South African President Thabo Mbeki pointed to the G7 conference of the wealthy countries that Manhattan, New York has more telephone lines than

those in the whole of Sub-Saharan Africa. A telephone call from Dakar, Senegal to Lusaka in Zambia is still routed from Dakar to Banjul to London, and London to Lusaka (Panos Media Briefing No. 26, 1995).

Online Course Offerings at Selected African Universities

In response to this devastating inequity to access to technology and its impact on higher education in Africa, the World Bank, United Nations (UN) institutions, along with the European Union, the Canadian International Development Agency (CIDA), Australian Government, Kingdom of Morocco, and DFID in 1997 founded the African Virtual University (AVU) to work with African institutions in increasing access to relevant, flexible, and low cost higher education and training mainly in science and technology. Between 2000-2001 the AVU developed learning partnerships with 34 institutions of higher learning in nineteen African countries including Ethiopia, Ghana, Kenya, Namibia, South Africa, Tanzania, Zimbabwe, Uganda, Burkina Faso, Senegal, Mauritania, Niger, Rwanda, Burundi, Benin, Mozambique, and Nigeria. The AVU offers online and other distance learning courses through these institutions to serve millions of Africans (Dzvimbo, n. d.; Ekhaguere, 1999; Mutagahywa & Bakari, 2003).

The AVU intends to bridge the digital divide for Africa by enhancing the capabilities of Africans to produce, manage, disseminate, and consume knowledge. The AVU subscribes to deep learning through constructivist approaches to teaching and learning that foster modeling, coaching, scaffolding, articulating, reflecting, exploring, as well as the autonomous and reflexive praxis by the learners. The goal is the transformation of the intellectual views and habits of the students. The target students are Africans ages 25 to 40 and the headquarters are in Nairobi, Kenya with a center for research and innovation in open learning, distance education in general,

and e-learning in particular. These are the very principles of deep learning that are expounded by Weigel (2002) in his book called *Deep Learning for a Digital Age*.

The AVU academic programs are mainly at the undergraduate level. They include computer science, computer engineering, electrical and mechanical engineering, public health, teacher training, and management. It also offers advanced certificate courses lasting one year each. The first degree granting graduation at its member institutions was held in March 2005. The AVU uses a mixed mode delivery and pedagogical models utilizing Management System based on WebCT and satellite based content delivery network (VSAT) for online and Internet access. It has online library with full text journals. The AVU believes that access to the Internet is crucial for research and teaching to the benefits of both faculty and learners. It therefore considers Internet connectivity pivotal to its pedagogical and sustainability mixed models needed to do away with hierarchies in communication to embrace of what it calls a hyperarchy structure of communication. The AVU claims that direct alleviation of poverty with rapid socio economic and technological advancement for Africa is contingent on investment in human resource development (Dzmimbo, n.d.).

The AVU instructors were initially in the United States of America, France, Canada, and Belgium and they provided education to students in Africa through satellite communications (Ekhaguere, 1999). Today, trained native African personnel at the various partner African institutions are doing most of the teaching. The AVU claims this century to be Africa's century while Thabo Mbeki of South Africa calls it the age of African renaissance. The University of Dares Salem (UDSM) in Tanzania will be providing computer science studies to all AVU partner institutions in Africa by 2007 due to its state of the art capacity in advancing technology (Mutagahywa & Bakari, 2003).

The University of Dares Salem in Tanzania for purposes of this paper; is the second selected University that offers online courses for both campus and long distance learners. It is a leader for online education in Africa south of the Sahara with the exception of Egypt and South Africa. By 2002, it was offering 699 online courses at various levels of development through its Technology Enhanced Independent Learning (TEIL). The entire university and its libraries are on line. Through TEIL, the UDSM has facilitated collaborative teaching and curriculum development with other universities in the region. The TEIL e-learning centers are meeting a growing demand for information communication technology (ICT) knowledge in Tanzania. The UDSM has become a cyber block with e-learning and e-business occurring at levels equivalent to those in developed countries. The UDSM led the formation of the Tanzania Education Network (TENET) among Tanzanian Universities and institutions of higher learning to alleviate the acute shortage of skilled manpower that these institutions were experiencing by carrying on staff training and exchange programs (Mutagahywa & Bakari, 2003).

These authors also indicated that the UDSM uses a dual mode long distance education delivery facilitated by ICT via the Web, Video Conferencing, and CD-ROM to link to the AVU. The UDSM has established collaborative distance education with other universities in Africa and the world. For example, the UDSM runs joint courses in International Relations and Regional Integration in collaboration with Makerere University in Uganda and Tufts University in the U.S. (Mutagahywa & Bakari, 2003). Online courses and degrees are also being offered at Zimbabwe Open University, National Open University of Nigeria, and the Open University of South Africa among others (Ekhaguere, 1999).

In addition to the above efforts, Ekhuaguere (1999) has argued for institutions of higher learning in Africa to adopt teaching, learning, and research methods with potentials to

accommodate large numbers of qualified candidates by rapidly diversifying and expanding higher education training opportunities in the face of limited access to Internet technology deliveries. In light of this, he has suggested a number of collaborative methods to increase access both to the Internet and higher education on the African Continent. The following are some of the developments this author has highlighted in this arena.

Transnational education is a diversified method that employs three major delivery systems that are further enforced by need based tailored methods. The networking /partnership method is based on collaborative efforts of African, European, and North American institutions to strengthen graduate education and research. The networking is done in one of two ways. The TELEteaching System for Universities is a project linking six engineering schools and colleges in Belgium, Cameroon, France, Morocco, and Tunisia through Internet based courses in engineering sciences. The second networking method is a Francophone kind called in French RESeau Africain de Formation A Distance. It involves African universities in Benin, Burkina Faso, Guinea, Mali, and Togo for the purpose of delivering teacher training courses from France through the Internet.

The entrepreneurial method of providing higher education in Africa involves higher educational institutions in Europe, North America, and Australia that mainly want to fulfill the management strategy of their mission statements through aggressive entrepreneurial approach. The education provided is a commercial enterprise because they target the rich in African societies, lower admission requirements for them, promise to grant them degrees in banking, business administration, and actuarial science or management after retrieving tuition (Ekhaguere, 1999).

This author also stressed the need to consider intranational distance education through open universities and dual mode institutions like Burkina Faso, Cameroon, Congo, Ivory Coast, Ghana, Madagascar, Mauritius, Nigeria, South Africa, and Zambia among others. It involves students and teachers in the same African countries. It is in vogue on the continent and it uses a lot of the traditional long distance delivery techniques like radio broadcast, cassettes, audio visual aids, and paper based materials. This method has increased access to higher education in many African countries beyond what the traditional institutions could accomplish.

To this end, a group of African distance educators founded the African Council for Distance Education (ACDE) in January 2004. Its goals are to bolster distance education curriculum development, to bolster the training of skill personnel to teach the courses, and to develop policies on accreditation and transfer of credits between institutions (Pityana, 2004). In short, the geographical digital divide facing Africa south of the Sahara has been delineated to synergize the evidence presented for the digital divide relating to diversity and disability issues. Having said this, this paper has concluded with the following.

Conclusion

Bringing awareness, of what the digital divide is and which groups are impacted, is the first step in working towards a more equitable society. The digital divide is a serious concern in the world. This paper has delineated a number of its impacts and those groups currently affected. The little progress made for each area covered has been noted. Nevertheless, there is a very urgent need for global collaboration among governments, institutions of higher learning, humanitarian organizations, and financial corporations to consolidate efforts in closing if not narrowing this gap. This will lead to many well informed people making prudent contributions in the development and improvement of global knowledge and economy.

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