

DENVER UNIVERSITY

DIGITAL DIVIDE

EXPANDING THE CONVERSATION TO INCLUDE TECHNOLOGICAL LITERACY

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Abstract

The digital divide concept articulated the existence of a gap in those technological benefits bestowed. Academics emphasized that the inequities were rooted in the economic means to obtain technology, and they were right. Now, where programs have advanced those who could otherwise not achieve the possession of hi-tech goods, the problem seems to persist. What is now realized is that the modern, connected world must persuade the digital divide conversation to emphasize the need for proficiency, awareness, and literacy in using technology to help digital outsiders enter into the information and communication community, and empower themselves to change their lives with this advanced digital commodity.

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Intro

Many academics have pointed out that access and availability to technology are the most important factors of the digital divide. Others have highlighted additional reasons such as economic well being, race, gender, and geographic location as substantial factors that influence a person's adoption and adaptation to communication and information technology. Though most of these ingredients can be manipulated for better inclusion of digital outsiders, many constraints are traits inherently locked in by locality, socio-economic class, and by national or international policies. In many ways technology resembles a commodity, and generalizing information and communication technology in economic, economies of scale terms, some areas of the world just do things superior or more expeditiously. There will always inequities with technology, but reasons will vary.

In many ways, society must emphasize the additional, critical obstructions digital outsiders are burdened with. The equitable lack of technological knowledge can additionally influence the development of a digital literacy. This is not a new analysis by any means; academics have noticed the negative impacts of this issue since the late ninety's. Somehow though, the immensity of the problem has been downplayed as time has progressed.

Although an array inputs influence aspirations to become involved with the digital community, there now seems to be greater forces in certain areas

that create less space in the divide we recognize today. The proliferation of technology in all walks of life is apparent to all. Advances in telecommunication networks and the falling price of technological devices have allowed many, who 10 years ago would have had no access to such services, to be incorporated and benefit from such knowledge sources. The finest example of this is the thousands of untouchables in India who now have pre-paid phone plans and cheap mobile phones at their disposal (Jeffrey 2012, 69).

As we continue to look at the digital divide quandary, a narrative of the aforementioned shift in ideology must be rendered. What must be edited in this conversation is the argument which contends that economic class and access to technology networks solely influence a human's social and economic potential. Now, another more momentous discourse should play the protagonist in the digital divide narrative. The modern, connected world must persuade the digital divide conversation to emphasize the need for proficiency, awareness, and literacy in using technology to help digital outsiders enter into the information and communication community, and empower themselves to change their lives with this advanced digital commodity.

They Say

The digital divide conversation alludes that economic access to technology is the indispensable factor determining a group's ability for

inclusion in the technology and communication community. As William Friedman, an academic who first studied the effects of the digital divide states, "Certainly, if an individual lacks the means to buy a computer (or internet machine) and pay a monthly fee for access, he or she will be on the wrong side of the divide" (Friedman 1999, 2081). Most people would affirm that in a world with one billion people using the internet, the question arises on how to provide access for the other six billion people not using the internet. Access is a legitimate constraint for acceptance into the digital community. But this argument must take into account the radical technological changes of recent years. The economic gap of having the technology to obtain admittance into the community is closing.

Today, technology is literally growing at the same exponential rate as genetic diversity once did long ago when inorganic elements combined to create amino acids which, combine to create complex proteins, i.e. DNA strands (Schaller 1996, 26). As soon as those elements combined into organic compounds, life aggregated at incredible velocities. The International Telecommunications Union, which last released data in 2012 makes a generalized statement that, "information and communication technology uptake continues to grow worldwide, spurred by a steady fall in the price of telephone and broadband Internet services" (ICT 2012, 1). What this comprehensive statement does not show is how incredible this growth actually is. Broadband prices across the world have plummeted 75 percent in

the past 5 years; technology use in developing nations has intensified by 78 percent in 2012 alone; and there are now over 6 billion cellular phones in use today in the world (ICT 2012, 1). If you were to graph this growth pattern, it would most closely resemble the exponential growth curve of life on earth in its early stages.

We have witnessed considerable changes in the digital growth cycle over the past ten years. Somewhere, in every walk of life, you can find communication technologies enhancing the lives of middle class Americans to those considered below the world poverty level. Whether its soccer moms making calls who are late for the game, or moms in Southern Africa making calls who are late arriving to the market to sell their cows, digital technology is spreading like wildfire and will continue until we reach 100 percent saturation of the human population. This permanence is not to negate the current economic and structural barriers that add to the digital divide. *The Journal of Developing Areas* published an article in 2004 concluding that, "96 percent of the Internet's host computers reside in the highest income nations with only 16 percent of the world's population" (Kamssu 2004, 153). Economic access to technology is still to this day a large contributor to the digital divide. But as technology growth rates continue and the economic barriers fall, what will the future digital divide consist of?

The academic Madanmohan Rao published a paper in *Economic and Political Weekly* which commented on US internet networks mentioning that,

“US networks have always been central to the internet, of course; what’s important is how that persists when the internet reaches people everywhere” (Rao 1999, 3320). Can we envisage time when everyone has access to the internet? When will all of the seven billion people on this earth have access to communication and information technologies? These types of questions are tough to comprehend, but with growth as it is, a completely connected world could be reality in the next 40 years. Inequities will continue to exist far into the future and will influence the ability of future generations to be connected to the digital community. However, these issues will be overshadowed by other elements of the divide.

In observance of my own personal engagement with technology, I question if I will personally be able to maintain association at the speed at which technology is moving. I question if I will be on the right side of the divide when I am older. I view my 70 year old mother, a successful college graduate who was an educator for many years, and her struggles with understanding technology as exemplifying this concern. She embodies those who have the economic ability to engage in digital communities, but can’t or don’t do so. The question that arises: can we define this dilemma and articulate the needs of those who fall in this category?

I Say

Thomas L. Friedman was correct when he expressed in his bestselling book *The World Is Flat*, that technology has recreated the world. He

illustrates that, "It is now possible for more people than ever to collaborate and compete in real time than at any previous time in the history of the world – using computers, email and fiber-optic networks" (Friedman 2007, 8). By doing so, he foretells how current and future generations must fight for a position in the global economy, by adapting to technology and becoming creative experts in new and upcoming platforms. But what Friedman does not allude to in his book is that this technology, and access to this technology, does not necessarily promise an individual can or will connect to the digital "flattened" world. What is lacking in his argument is the subtle acknowledgement that access to technology does not guarantee belonging to the digital community.

A 2010 article published by the BBC takes a closer look at this disconnection. Technology reporter Jane Wakefield examines the digital divide in her local vicinage of Nottingham UK where municipal and federal governments have invested millions of pounds in technology infrastructure in addition to subsidizing low income families with either free or low cost hardware and internet connections. Once these governmental allocations were complete, a palpable trend emerged within the community. Like many teens in the area who received assistance from government capitalized technology programs, Tracy "has a PC gathering dust in the back bedroom because she doesn't know how to use it" (Wakefield 2010, 1). The article quickly highlights an obscure micro social mechanism that exists within a

community; that the general absence of technology proficiency will eventually negate the given commodity. Ms. Wakefield additionally alludes to the same aforementioned problem articulating that, "43% of those offline would remain so even if they were given a free PC and broadband connection" (Wakefield 2010, 4). Again, the denouement of these findings exemplifies the core issue, concluding that access to technology does not unquestionably empower adoption by the community, nor to engage with it. The divide colloquy overlooks a fundamental step in the adoption process that access does not exclusively alleviate.

What is readily prevalent in review of these deductions is a depiction of a community, with all the essential components to use technology, which fully disregards the urge or necessity to belong. Access to these technologies only alleviates half of the problem and brings these communities only half way towards technological literacy. Yes, the obvious first step is getting the technology in the hands of those who need it. But creating programs and policies to further empower communities with the knowledge they need to succeed is the next fundamental, missing step. The conversation of the digital divide as we know it must be able to blueprint a path for the digital have-nots to attain hi-tech literacy.

Association to computers comes in many divergent manifestations. Although Friedman emphasizes the need for all progressive communities to be fully literate and versed in new creative technological undertakings, in

reality, the real life quandary appeals us to focus our attention on escorting all types of users towards a minimal level of technological expertise. A 2009 CBS web video program focused on the next generation of the digital divide. It gave prominence to the voice of educator Bob Pearlman who asserted, "It is one thing to have a fiber optic cable connection, it's quite another to know how to exploit its benefits. Teaching to understand and take advantage of the technology is the goal of the 21st century" (Hoar 2009, 3). By understanding this reality, we can now focus our attention on programs that establish a real social connection with technology for those who do not understand it. It is the only way outsiders will ever benefit from this hi-tech commodity.

Cuba under Castro once made reading literacy a number one priority and the campaign ultimately increased the nation's literacy rate to 96 percent of the population (Abendroth 2009, 86). We as a world of nations must make that same effort to endow people the opportunity to attain a baseline technological literacy. Cuba did not buy more printing presses, it did not buy more books, it created a national campaign to recruit teachers to teach people how to read. In juxtaposition, if new policies are able to build the critical skills needed to navigate technology, not just to finance the acquisition of access nodes in the network, the benefits of technology should trickle down into all levels of society. That may seem like an all encompassing statement. But acknowledging the power that literacy gave

people over the ages, specifically after the dark ages when the printing press was invented, should affirm this argument as ever more realistic. Giving people the knowledge and power of what their technological literacy might bring to change their immediate lives will help resolve many of the issues the concept "digital divide" conveys. The only question that remains is how to actively exhibit what that power can really do, and how one is able to control it?

"We found that even mentioning the word computer to elderly people put them off" (Cudd 2013, 4) Dr. Peter Cudd admits in a study on geriatric technology use. Like so many other diasporas outside the digital community, it is too easy for those not included in the conversation to feel as though they are automatically at war with technology (Compaine 2001, 306). Fear of the unknown will always stifle potential. But mindful of the greater picture, we can direct the digital have-nots to share a connection with the technology they use, to get over that fear, change their views and empower those who need it most. Bringing about this paradigm shift does not mean moving mountains. The Arab Spring concludes that with a few simple skills, logging into Facebook and connecting with the community, technological literacy can bring about radical immediate change (Jaffrin 2003, 1). The Digital Divide exemplifies the modern individual's struggle in a hi-tech exclusionary society, just like the Arab Spring did for so many Arabs. Those currently managing the digital community cannot just dump hardware at the

feet of those excluded. They are obligated to give the opportunity for people to understand, use and empower themselves by teaching real life technological literacy to the masses. We can and will bring about radical immediate change in this widening digital divide if that conviction is perused by all those who are privileged enough to already have that literacy.

Conclusion

The benefits of technology have influenced the masses for over 30 years now. The digital divide concept articulated the existence of a gap in those technological benefits bestowed. Academics emphasized that the inequities were rooted in the economic means to obtain technology, and they were right. Now, where programs have advanced those who could otherwise not achieve the possession of hi-tech goods, the problem seems to persist. People considered excluded from the technological community do not care to foster an alliance with the one commodity which has been proven to benefit all those who partner with it. The conversation digresses further.

But many academics have expanded the conversation, and they all reinforce the idea that a paradigm shift must take place. The modern resolution to the digital divide must come in two parts, the machine, and more importantly, the literacy to empower. In his essay, Deepak Subramony summed up this issue perfectly, "Now while access to technological products

is certainly the most obvious of issues encompassed by the digital divide concept, it has quickly become apparent to critical scholars that equitable technological proficiency is, if anything, even more crucial" (Subramony 2007, 36). Technology will most likely be there when you need it. Now all one needs is the understanding to control it. Or as I like to say, give a man a smartphone, he might watch re-runs of American Idol. Teach a man what a Smartphone can do, he might just start a revolution.

References

- Abendroth, Mark. 2009. *Rebel literacy: Cuba's national literacy campaign and critical global citizenship*. Duluth, MN, USA: Litwin Books.
- Block, Walter. 2004. The "digital divide" is not a problem in need of rectifying. *Journal of Business Ethics* 53, no. 4 (April):393-406.
- Compaine, Benjamin. 2001. *Digital divide: Facing a crisis or creating a myth?*. Cambridge, MA: MIT Press.
- Friedman, Thomas L. 2007. *The world is flat. A brief history of the twenty-first century*. 3.0th ed. New York, NY: 8.
- Friedman, William H. 1999. The digital divide. *Seventh America's Conference on Information Systems*, University of Central Arkansas, Conway, AR. No. 1:1-10.
- Hoar, Jennifer. The digital divide 2.0. CBS News.
http://www.cbsnews.com/8301-500695_1621699023.html?pageNum=1, February 11, 2009. (accessed March 8th, 2013).
- International Telecommunications Union. "Measuring the Information Society MIS 1012." ITU website. PDF File. http://www.itu.int/ITU-D/ict/publications/idi/material/2012/MIS2012_Map.pdf. (accessed February 8th 2013).
- International Telecommunications Union. "Press Release: Latest global technology development figures." ITU,

http://www.itu.int/net/pressoffice/press_releases/2012/70.aspx#.UQs wPaXhC2z. (accessed January 28, 2013).

Jaffrin, Manuel. 2003. Learning in the knowledge economy: The role of technology. *TOJET : The Turkish Online Journal of Educational Technology* 2, no. 2,

<http://search.proquest.com/docview/1288367970?accountid=14608>.

Jeffery, Robin. 2012. Mobile-izing: Democracy, organization and India's first mass mobile phone elections. *The Journal of Asian Studies*, Vol. 71, No. 1 (February):63-80.

(Justin Reynouard. *Neo Third World*, 2012, Private Catalogue, Denver CO)

Kamssu, Aurore, Jeffery Siekpe, and James Ellzy. 2004. Shortcomings to globalization: Using internet technology and electronic commerce in developing countries. *The Journal of Developing Countries*, Vol. 38, No. 1 (Autumn): 151-69.

Rao, Madanmohan, Sanjib Bhandari, Anjali Sinha and Wahaj Siraj. 1999. Struggling with the digital divide: Internet infrastructure, policies and regulations. *Economic and Political Weekly*, Vol. 34, No. 46/47 (Nov. 20-26):3317-3320.

Schaller, Bob. 1996. The Origin, Nature, and Implications of "Moore's Law": The Benchmark of Progress in Semiconductor Electronics. *Spectrum I/EE*, Vol. 9, No. 1 (September 26, 1996):1-36.

Subramony, Deepak P. 2007. Understanding the complex dimensions of the digital divide: Lessons learned in the Alaskan arctic. *The Journal of Negro Education*, Vol. 76, No. 1 (winter):57-67.

Wakefield, Jane. A look behind the digital divide. BBC News.

<http://news.bbc.co.uk/2/hi/technology/8548456.stm> (accessed March 8, 2013).

———. Old meets new in the digital divide. BBC News.

<http://www.bbc.co.uk/news/technology-11501622> (accessed March 8, 2013).

Appendix A

Quantitative Vs Qualitative

Article 1

Rao et al. 1999. Struggling with the digital divide: Internet infrastructure, policies and regulations. *Economic and Political weekly* 34, no. 46/47 (Nov. 20-26): 3317-3320.

In this article the researchers conduct a summative, quantitative evaluation of internet infrastructure in South East Asia. ISP (internet service provider) regulation in this area has slowly moved from a government owned platform to a private industry provided platform. The theory they deduct leads them to the scientific hypothesis which explains the rapid growth of ISPs in the area. By collecting data on ISP providers and the actual number of ISPs in the area, they have made clear cut observations illustrating the considerable growth rates in the previous 10 years. Based on these observations, they are able to make empirical generalizations concluding that the move of the ISP regulatory body to the private sector was a good move as compared to the latter.

They chose this sort of quantitative research because specific data is available, ISPs can be counted in the area. This sort of data can show trends. These trends show why there existed a rapid growth of ISPs in South East Asia in 2002-2004. The main result is a great portrayal of growth benefitting under private sector regulation on the basis of empirical data

collected in the area.

Article 2

Subramony, Deepak P. 2007. Understanding the complex dimensions of the digital divide: Lessons learned in the Alaskan arctic. *The journal of negro education*, (winter):57-67.

In this article the researcher examines the equitable access to technology Inupiat Eskimos have in the Alaskan Arctic. He uses an ethnographic case study, a qualitative research method for exploring cultural phenomena, which dives deep into the lack of knowledge and the systems which exist as barriers for Inupiat Eskimos to become involved in the information and technology community.

I would like to speculate that the writer used this type of research method because empirical data, that could be measured, could not be found or did not exist in this remote part of the arctic. I would also assume he used a qualitative research method to expand the research to include variables that were not obvious at the start of his project. He would like to understand how this divide came into being for this particular population of people.

The result was a well detailed look into the problem of the digital divide in the Alaskan Arctic highlighting specific problems and issues that would not be apparent in a typical quantitative research method.

Compare and Contrast

Both articles relate directly to the problem I am researching which is the growing "Digital Divide" between those included in ICT and those not included in ICT. The difference is the purpose at which they are researching and what they are trying to answer. The quantitative article is specifically investigating the affects of internet infrastructure and regulation in the area as exposing communities to ICT capacities and e-commerce. This method works perfectly because the end goal is make a graphical look at what has been done and what needs to happen next. On the other hand, the qualitative article wishes to carry the ongoing conversation of the digital divide past the quantitative data of internet users in the area to a more ethno-centralized, personalized view of the factors creating barriers to ICT.

In short, I cannot choose one research method over another; they both show a level of validity and expertise. Their research follows true academic research and writing. But, if I need to choose a certain research type it would be more on the side of qualitative based on the questions I would like to ask and what I am trying to accomplish with my thesis; expand the digital divide to include more factors other than economic barriers but social and psychological intellectualism issues.

Appendix 2

Visual Rationale



Fig. 1. Reynouard, *Neo Third*, 2012, digital print, 3000x4000 pixels, Justin Reynouard, Denver CO.

Graphic 1

I chose this image because it subtly illustrates how technology is already in the hands of those who would be considered not to have such expensive devices. Here are 3 women making tamales in the main market of Granada Nicaragua. Although these women, based on global income statistics, probably make close to 5 dollars a day, they have twenty first century technology at their disposal. As my thesis proclaims, the real issue of the digital divide is not an matter of access but an issue of technological literacy. This personal image, I believe, denotes the fact that technology is available,

even for those who would be considered not to have it. This helps the reader, who may not have experience in third world situations, experience the wide dissemination of technology across the globe and in remote, poor areas such as Nicaragua.

Graphic 2



Website:

Fig. 2. The International Telecommunication Union, *MIS 2012*, digital graphic, height approximately 14", International Telecommunications Union website, http://www.itu.int/ITU-D/ict/publications/idi/material/2012/MIS2012_Map.pdf (accessed March 8th, 2013).

This image depicts the levels of internet connectivity across the globe and ranks the countries from best to worst. Although this depicts much of the world as having basic internet connectivity, I would like to propose we relate this image to the history of the internet and realize this level of connectivity has only happened in the last 30 years, i.e., exponential growth. This infographic helps the reader put into context the extent of the connected world

and its new influence on modern civilization reaching from the poorest to richest nations. I could include something that depicts the real growth of technology in the world and might have to with this image out for something which better illustrates this concept.