Literature Review

Internet Access and Global Education

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Over the last thirty years the "global use of the internet has risen exponentially" (Sandle, 2016) yet there is still almost 50% of the world's population (3.6 billion people) that do not use, or have access to the internet according to Internet World Statistics (2017). The United Nations Sustainable Development Goal 4 is to "Ensure inclusive and quality education for all and promote lifelong learning." This literature review will examine the research as it relates to the implications and importance of internet access, barriers and obstacles that limit that access to certain populations, how internet access impacts global education within four different countries, and trends that will help to increase access to the internet and subsequently, improve global education. Research will show that limited or no access to the internet can hinder education to a vast majority of the global population when technology is inconsistently and disproportionately distributed (accessible).

Literature Review

The "process of globalization increasingly requires people to recognize how forces from all over the world previously considered distant and remote impinge on their daily lives" (Arnove, 2016). Well into the first decade of the 21st century technology continues to grow and change exponentially and as the capacity of the computer microchip is doubling approximately every two years, it increases the ability of what the internet can and does deliver (Friedman, 2016). This is creating new paradigms of how students can be educated. As big data is able to (seamlessly) analyze student input and use that data to then customize individual learning experiences, the need for internet access becomes imperative.

Importance of internet access

Global Connections. According to Cookson's article *10 Disruptions That Will Revolutionize Education* (2017) students will continue to engage in a much more globally connected world. He suggests that "learning avatars will become commonplace" as they personalize student experiences to meet immediate needs and "networking with an international web of colearners" will allow students from all around the world to work collaboratively solving problems using the "power of collective intelligence" (Cookson, 2017).

Human Rights. While the internet has expanded to parts of the world that were "previously largely excluded from the global network of information and knowledge" (Rye & Stokken, 2012) the United Nations General Assembly Human Rights Council (HRC) comments, not only on the importance of internet access, but believes it should be a human right. On June 27, 2016 The HRC wrote:

> "the promotion, protection and enjoyment of human rights on the internet. The concerns of the Council express that 'access to information on the Internet facilitates vast opportunities for affordable and inclusive education globally, thereby being an important tool to facilitate the promotion of the right to education, while underlining the need to address digital literacy and the digital divide, as it affects the enjoyment of the right to education.'" (UN General Assembly 32nd Human Rights Council, 2016)

This was a factor in the actions of the 2030 Agenda for Sustainable Development Goals. recognizing education as a key tenet for ending poverty in all its forms, everywhere (2017). Last June the UNESCO reported that global poverty could be cut in half if all adults completed a secondary education (2017). Education has the ability to have an impact on both economic growth and poverty, directly and indirectly. Education has the ability to lift people out of poverty. By adding just two years of schooling for people in impoverished nations, 60 million people could be lifted out of poverty. Two years of additional secondary education increases that number to 420 million people not in poverty or almost half of the world's poor population (UNESCO, 2017). These impoverished populations consist of developing nations, women, and

people living in poverty, the population that are denied internet access (Sandle, 2016). This aligns with the United Nations HRC recommendation that access to the internet access is imperative to catch up and keep up and be involved in education so that impoverished nations can rise out of poverty (UNESCO, 2017).

Internet penetration and GDP. Finally, there is a correlation between high internet penetration and high gross domestic product (GDP). Improved internet access to the most remote impoverished areas can lead to more to increased awareness of other people and nations around the globe. This consciousness and understanding would ultimately build a desire for education (resulting in an improved GDP because of a decrease in poverty as there is an increase in education) a reality for anyone and everyone (Friedman, 2016).

Barriers and obstacles

People all across the globe, whether urban or rural, have differing views of the world and they are all valid (Arnove, 2016). In order to bring internet access to remote parts of many countries there are a number of obstacles to be considered. Simply accessing the internet, while considered a Human Right by the United Nations, is still a decision that can be made by a country or government for the individuals that are under its authority.

Censorship. Many nations and countries impose different levels of censorship with different restriction ranging from no or low censorship. Countries whose torrents are restricted: United States, Canada, Greenland, Mexico, and the Bahamas, versus countries with little to no internet access and heavy censorship of torrents, pornography, social and political media include (partial list): China, North Korea, Iran, Singapore, and Saudi Arabia (Internet Censorship World Map, 2017). When access to the internet is controlled, limited or denied it hinders an individual's

ability to access knowledge, education or even the capacity to become connected to the many different parts of the world (Friedman, 2016).

Multidimensional Poverty. Poverty alone limits many opportunities for individuals and nations, but consideration of people with Multidimensional Poverty (as described by the United Nations Multidimensional Index (MPI)) is a factor that considers "overlapping deprivations suffered by individuals at the same time" (UNDP HDR Report, 2016). These indicators use health, education, and standard of living and describe about 1.5 billion people in 102 countries. While multicultural poverty is declining, there is still about 29% of the population worldwide that are considered at risk. (United Nations HDR Report, 2016). Awareness and understanding of how these overlapping situations magnify the depth of poverty can be used to guide policy makers to focus on the trends and conditions that contribute to this demographic of people. When multidimensional poverty is considered as a reality it can begin to help people move toward autonomous lives.

Data Poverty Index. The "digital divide" defined as "economic and social inequity with regard to access of, use, and impact of Information and Communications Technologies (ICT)" (Wikipedia, 2017) has been a concern since the 1990's and is a contributing barrier to the non-digital vs the digital consumers of the internet. As with the MPI the Data Poverty Index (DPI) takes into consideration a number of different metrics that can measure access to technology. "The DPI is based on internet speeds, numbers of computer owners and Internet users, mobile phone ownerships, network coverage as well as provision of higher education" (Leidig & Teeuw, 2015). So, access to the internet requires high device, data, and telecommunications charges and digital literacy challenges which are often out of reach in impoverished nations as they have reduced income levels (West, 2015) making it a key barrier to internet access, and therefore,

internet penetration is often the lowest in countries with the lowest GDP per capita" according to a Deloitte (2014) study.

Hardware and Software. Lastly, another obstacle to be considered, is the consideration of access to appropriate hardware and software for the capacity of the broadband, as well as infrastructure that is available in many less developed nations (Greenhalgh-Spencer & Jerbi, 2017). Greenhalgh-Spencer & Jerbi discuss these "western expectations and global education" in which they offer two types of "design-actuality gaps." The first is places "where there is access to internet infrastructure, but very little access to ICT-assisted educational programs" and second "where ICT-assisted educational programs have been deployed, but there is little access to the internet infrastructure that is necessary to support these programs" (Greenhalgh-Spencer & Jerbi, 2017).

Internet access impact on education within different countries

Internet access not only varies from nation to nation, but accessibility within countries, whether a super power, or a smaller nation, can differ resulting in educational experiences being inconsistent. Examples from China, United States of America, Africa, and India will be discussed.

China. China, with one of the most censored accesses to the internet (Internet Censorship, 2017), has the goal of becoming not only one of the top destinations for global higher education, but hopes to increase mobile internet access which will ultimately benefit education. In the article *China: Can the World's Top Source for International Students become it's Leading Destination,* middle class Chinese parents, understanding the importance of education, have sent their children abroad to get the best possible education. This has Chinese official's realizing the benefit of having students stay in their own country to be educated. The government claims that

international enrollments have grown, increasing diversification of students educated in China, however with much of the resources going to the top tier elite schools and as China moves toward these goals, the Chinese Communist Party (CCP) has raised concerns about "Western values." To this end the CCP has tightened controls on internet access thus limiting access that allows for "foreign research resources as well as academic freedoms" (Schulmann & Ye, 2017).

United States. The United States, with lowest levels of restriction to the internet still has areas of the country that do not have access to the internet. American schools today are putting more and more emphasis on the use of computers both in and out of school. Many school districts aspire to a 1:1 initiative so that each student has a device which allows for greater student engagement and ultimately, better education. Unfortunately, school-age children in families, all over the country, with lower incomes are unable to afford the high cost of internet access (higher than other countries) putting these children at a disadvantage (Kasperkevic, 2014). "A further look into poverty reveals more and more unconnected Americans. According to Pew-Research, one-third of those making less than $20,000 a year do not go online at all. Another third go online, but do not have internet access at home. Of those making $30,000 or less, 45% of mobile internet users go online mostly with their cellphones. Once again, poverty is a limiting factor to education (Kasperkevic, 2014).

Africa. Lagging very much behind the rest of the world in relation to internet access as it relates to a quality education is Africa. The *Internet for Education in Africa Report* states that the enormous population in Africa offers unique challenges where education is concerned. Reliable access to the internet for resources, virtual labs, as well as exposure to global ideas and communication with people all over the world have become essential in the 21st century classroom. The lack of quality teachers, outdated, or unavailable learning materials, and inadequate space require an "out of the box" approach to education is difficult. While there has

been a variety of innovative uses of internet education, it is not consistent, or equitably distributed throughout the country.

India. Internet penetration for all of India as of 2016, according to the website Internet Live Stats (2017), is about 34% up from about 18% in 2014. The article *How technology is set to transform India' fragmented education system* (Gupta, 2014) reports that India's primary and secondary schools (public and private) have about 12% internet access, and it is slow. Investments by technology companies have played a role in both public and private schools in India. Public education has received funding for investment in educational technology, yet there was a disparity as to whether it was being used (and if it was functioning) at all. Conversely, private schools, also privately funded, have adopted technology much more quickly, making them the target of educational technology companies. The efforts to close the gaps and raise up the low-income segment of India's poor population continues to be a struggle. Access to affordable, functioning, consistent, high-quality technology, used at elite-private schools is making its way to low-income government school systems by way of interested private companies.

Trends

Online education between students from developed nations and developing nations offer a look into the future of internet access and global education. Working to make the internet, not only accessible to all, but consistently available to all global citizens is one goal, as is the way that access can be controlled.

Cultural Dimensions. A review of a the paper *The Implications of the Local Context in Global Online Education* written by Stale & Stokken (2012) Suggests that student's local context, between social, material, and cultural dimensions of a students' daily life that impacts their learning across the global classroom. Students from African nations needed to negotiate with

family members to help out with their daily responsibilities so that they could do their online work, while the Norwegian students were less impacted. While African students reported their social/family life was significantly (positively) impacted (eight out of nine students) only three of the Norwegians made a similar response. Materially, access to the internet was more of a concern with the African students. While Norwegian student internet access was less impacted because they had financial support from the Norwegian educational loan funds, African students often needed the money that they used for access to the internet, for daily living. Additionally, Africa's weak technological infrastructure and intermittent electricity supply made it difficult to collaborate compared to a "taken for granted" access that Europeans come to expect. A frustration for the Norwegian students was the inconsistent nature of collaborating with the African students because of these issues. The experiences between African and Norwegian students taking the same online course had both groups adjusting to their roles as online students. This trend will continue to build as more and more students opt for online, global education as our global internet access improves.

Mooc's. MOOC's (massive open online courses) have seen growing enrollment as students from all over the world seek to gain access to higher education. With such a diverse "classroom" a group of researchers from MIT and Stanford noted that no all education systems are not created equally. In the MIT article, *Small interventions are creating big effects in closing the MOOC achievement gap,* which gleaned information from the article *Closing the Global Achievement Gaps in MOOCs* (Kizilcec, et al, 2*017*) states that, not only is there is a lack of broadband, or English-language proficiency, but that there is a feeling of being unwelcome or stereotyped in that they are less competent than their peers, or a "social identity threat." The research was

positive indicating that awareness of this issue can be dramatically reduced by brief interventions by the instructors. The encouraging results will further their studies in this venue.

Satellites. One of the ways to begin to level global internet access so education can be accessed anywhere in the world would be to consider the ways in which broadband is accessed. An article in the journal *Aerospace Research Central* titled *Ways to Distributed Earth Satellite Systems: What is needed to move forward?* (Selva et al., 2017) introduces the notion that there are many spacecraft with dedicated space and ground segments that have become decommissioned. While I was unable to access the full article, I do wonder if these satellites might be a way to connect the more remote regions of the globe to a more consistent and effective internet.

Out-of-School Children. As of 2015 the UNESCO/Unicef report about the number of children who are out of school and what must be done to make sure they are all in school. While free, available and adequate internet access to allow for global education is the ultimate goal, if students are not going to school this needs to be a top priority. *Fixing the Broken Promise for Education for all* states "The findings from the Global Initiative on Out-of-School Children show that most countries need a policy framework consisting of three priorities: broad investment to strengthen and expand education systems, a sharp focus on inclusion and the quality of the education on offer, and targeted interventions for the children who are the very hardest to reach." These policy changes will help to lift children out of poverty by allowing them to make their "job" becoming educated.

Conclusion

This literature review has presented research that addresses the importance of internet access and global education. The four components discussed were: why internet access is important to global education, the barriers and obstacles that prohibit and impede access, the

impact on (limited) internet access to education in China, the United States of America, Africa, and India, and lastly, some trends and thoughts that may positively impact the future success of internet access as it relates to global education. In order to ensure that everyone has access a 21st century education basic human needs must be met. Reducing poverty will allow citizens the time and the ability to get an education. Additionally, governments need to grant more liberal internet access to its citizens allowing them to begin to understand and interact globally.

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