The Lines That Divide: A Study to Explore the Existence and Use of Technology and Innovative Educational Approaches to Foster Educational Progression among Indigenous Groups

Maxine McKay
University, Belize City
mmckay@ub.edu.bz

Abstract

It is often professed that "the highest performing education systems are those that combine equity with quality, access, innovation and technology" (OECD, pg. 5, 2012). Consequently, if education is to create opportunities for anyone who seeks scholastic self-actualization, systems must be set in place to ensure access. To add, there are many countries that have taken the lead to make education more accessible via the use of innovative and technological approaches. Furthermore , some of the more ingenious approaches include, Open Learning Platforms, the use of tablets, MiPads , IPods , Floating Schools , Libraries on Wheels and Mobile Buses to name a few. Needless to say, despite the evident manifestation of resourceful systems that are been used to make education more innovative and technological accessible, many groups continue to be left behind. The latter is especially evident in countries where indigenous groups are not accessing all levels of education. One literature reviewed indicated that "access at all levels, and in all regions of the world, Indigenous Peoples tend to have lower levels of literacy, enjoy fewer years at school and are more likely to drop out of school as compared to nonindigenous groups" (United Nations , pg. 19, 2009). The latter thus provides evidence that indigenous populations are at risk, thus innovative approaches and technology must be utilized to aid indigenous group in scholastic contentment. This study therefore sought to explore the extent to which technological and innovative educational approaches are utilized to afford indigenous groups fair educational opportunities. The study utilized archival data, observations, and face to face and telephone interviews to gather the needed data to support the study. Finally, recommendations are noted, so that policy makers can be better informed about the value of nontraditional forms of education, namely innovative education and the use of technology.

Introduction and Framework

Ensuring equitable access to education for all citizenry despite gender, religion, creed, age, sexual preference, abilities, economic status, geographic location, culture, and ethnic origin to name a few continues to be one of the greatest challenges for policy makers worldwide. To add, despite unprecedented successes in education around the globe many populations continue to be significantly marginalize and underrepresented at all levels in education. The issues as noted persist even with the advent of new approaches to education that encompass the use of technologic breakthroughs ,and creative and innovative teaching and learning platforms. Of critical importance is the fact that one of the minority groups that is significantly underrepresented in education despite open learning platforms, digital and technological gadgets, mobile schools and libraries, floating schools, and ICTs are Indigenous Peoples. The noted group represents an estimated 370 million of the world's population, approximately 5 per cent (%) of the total world population (UNESCO, 2011), yet their access and retention rates when compared to other groups are significantly low. The latter notation thus begs to ask, what barriers exists that continues to affect Indigenous Peoples' presence in education, an assertion that goes against several universal mandates and polices. The view that Indigenous Peoples (Populations) continue to be left behind also goes against United Nations (UN) Declaration on the Right of Indigenous Peoples, that which states that "Indigenous Peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning" (Article 14). Article 14 pronouncedly informs of the educational right of Indigenous Peoples, thus, if countries that are populated by this minority group are to be within prescribed mandates of Article 14, then measures must be sought to increase the educational access of this group. The United Nations continues to call on all countries to improve opportunities for the world's 370 million Indigenous Peoples, who continue to face major challenges in education. Lastly although there are various categorizations of Ingenious Peoples around the world key attention was paid to those from Australia, Canada and Belize. Notably, though the population that was study in more detail for the study was the Maya of Belize.

Literature Review

Indigenous Populations continue to remain behind Non-Indigenous Peoples across the globe. The reach of Indigenous Peoples around the world is large and this particular group can be found in many areas such as Canada, Australia , Africa, The United States of America, and Belize to name a few. Furthermore, one of the countries with perhaps one of the greatest representation of Indigenous Peoples is Australia, yet they are still significantly underrepresented at all levels of education. According to the *Aboriginal and Torres Strait Islander Social Justice Commissioner Report* 2015 "Aboriginals and Torres Strait Islanders students continue to be behind their non-indigenous nobles in educational space despite ongoing policies that attempt to rectify this matter" (pg. 5). The report also suggest that there is a "gap" in educational attainment that is unmistakable at all levels of schooling commencing from as early as Pre- K to tertiary education. The latter noted suggest that the issue of access is consistent with the underrepresentation of Indigenous Peoples in the Australia. Additionally, relative to the limited representation of Indigenous Peoples is also the "digital divide gap" (Black & Atkinson, pg. 1, 2007) that exist between Indigenous Peoples who live in remote areas and those who live elsewhere. The "digital divide" remains the "leading theory as to the reason for, and the impacts, of differences in internet access and use" (Van, Dijk, para 1, 2005). Indigenous Peoples in Australia and many countries have limited access to online education and technology because there is a "digital divide" that exist due to access. Another country where Indigenous Peoples are evidently present is Canada where there is a growing Indigenous Population seeking post -secondary education, particularly via accredited courses (Kateines & Chignecto). Furthermore , despite the growing interest of Indigenous Peoples to access education , a significantly large gap still exist between Non- Indigenous and Indigenous Canadians (Downing, (2002), and Nickerson & Kaufman (2005),).The literature reviewed also suggest that although the presence of information and communication technologies exist in Canada, online learning technologies have been an under-explored approach for overcoming barriers and meeting needs of Indigenous learners (Nickerson & Kaufman, 2005). Nickerson & Kaufman (2005), also noted that technological approaches such as e-Learning is often not supported because it is assumed that Indigenous groups are often not active , since their culture rely more heavily on face -to-face learning that is inclusive of both visual and oral communications. Lastly, the only Indigenous Peoples in Belize are the Maya Indians, a group that also continues to be underrepresented in education when compared to their Non- Indigenous peers. The Maya still live traditional lives that exclude technological advancement for the most part. The Maya of Belize, primarily those who live in remote areas are not exposed neither at school or home to innovation or technology. The absence of technology and innovative approaches is limited in most areas, because there is no access to it and interest from companies and the Government to improve is slow due to the limited accessibility to remote areas. On the contrary, although there are many issues that persist as it relates to the existence and use of technology and innovative educational approaches to foster educational progression among indigenous groups there are some success stories. In Australia, the Australian Flexible Learning Framework, which commenced in 2008, provides Aboriginals with skills and knowledge of Vocational Education and Training (VET) sector via the use of eLearning. This particular approach creates opportunities for Indigenous groups that were hard to reach without the use of ICTs. This latter clearly shows that there are attempts to reach and increase access although issues persist. Another attempt to increase access for Indigenous groups is the use of Massive Open Online Courses (MOOCs), a completely free platform that offers opportunities for Indigenous populations in education. MOOCs are innovative and highly advanced interactive online courses in which machine- guided instruction replaces some, or all, faces to face teaching as well as customized instruction (Bowen et al., 2012, p. 9). Another interesting approach used to increase access is *Ning*, a platform that is used to reach teachers in remote parts of Australia. Boyle and Wallace (2011) also suggest that via the use of mobile technologies, language radio stations and Open learning platforms can be used to increase Indigenous Peoples presence in education. Clearly, the literature reveals several things: that Indigenous Peoples still struggle behind their other groups and there are innovative opportunities that are present that can aid in the increase of for Indigenous Peoples presence in education. Conclusively, the use and increase of technology is strongly recommend by many organizations such as UNESCO, that offers recommendations to Governments to " consider the creation of programs that incorporate ICTs and e-Learning that will allow Indigenous Peoples to benefit from the new opportunities offered by ICTs" (Resta, 2011, p.9).

Methodology

In order to gather the required data for this qualitative study, several data collection points were used to better understand the current stance of the use of technology and innovative approaches, if any, that are used to afford Indigenous Peoples of Belize fair educational access and opportunities.

Findings

Interview Synopsis and Results: In order to gather additional supporting data two set of interviews were conduct that aided in the validation of the required information for the research questions that were addressed. The population for this section were purposively selected and then divided into two groups. *Table (1)* highlights the demographic representation of each group that participated in the interviews. The groups were asked three key questions relative to the study. The responses were coded and are represented in *Table (2)*. The Total sample for interviews was (*n = 23*).

Table 1 (Demographic Data of Interview)

Group	Males	Females
Maya Teachers	5	3
Maya Students	10	5

Table 2 Interview Responses (Thematic Summarized)

Question 1
What do you understand by the following terms: • Education, Technology, Open Education, Innovative Education and Access
The respondents provided several definitions/ responses for the terms above: The general definitions are as noted below: **Education** – formal, very important way of creating better opportunities for your family. One respondent noted that he did not really understand the question (student), "Only men should be educated". "I can only get an education up to Standard 6". **Technology:** Almost all of the respondents noted that internet is technology for them and the computer- none of them mentioned any other forms of technology. Even after probing none of the respondents demonstrated any familiarity with social media or any other areas in technology. **Open Education:** The respondents made attempts to say what they understood from the term and they gave varying responses: "Open means outside of the classroom", "When you go on trips", "Anyone can come – meaning that age does not matter". One respondent noted that "Open education is when you go out in the milpa fields and learn how to plant corn and so on". "I think it is when we learn to make hammocks and other things". **Innovative Education**: This was the most discussed because the respondents gave varying opinions: Some of the more prevalent responses are noted : " Like when the Rain Gods bring rain, and the making of Tombs that is innovation" , " Innovation is how the Maya build the temples to make them last so long" , "When we make thatch houses and show our children", "When the teacher tells us to make airplanes and so right" **Access:** The respondents provided several responses to what they understood by access, the most reoccurring responses are noted: "Access is when you can enter somewhere from all different spots", " I think it means how you get on the computer or so , me not sure" , " It means when Guatemala try come here" ," Having a way to get somewhere"
Question 2: Can you state some technological devices that you use in school or otherwise? The respondents provided several responses to the question above: The teachers , indicated that they used the internet a lot, but only have access when they went into the town, they also said that they were not sure what else was meant by technological devices, except if I meant cell phones because they have that, and computer, and so on. One respondent noted that he does not have internet at his school, because it is located in a rural area and there is no internet, the respondent also noted the school only has five computers that are very old, one projector that is only used when they have meetings or workshops. The students gave an overall response that indicated that they have no access to technology in or out of school. None of them have computers, cell phones, or internet. One of the respondent noted that not even his parents have cell phones, because it cannot be used once they are in the village because there are no access to it.

Question 3: What can you say about innovative education and innovative ways that help to make teaching and learning more accessible for you?

The respondents (students) stated that they think innovative education is when the teacher, makes them make charts and so on, and when they make water cycle or the Maya ruins. They were unable to provide any additional information about what is innovation for them. The teachers noted that they do a lot of trips to give students the experience of what is outside of the classroom. They also said they do a lot of presentation and guest presentation from persons from the community to teach the students about their culture. The teacher respondents also said they use the radio (for oral comprehension) a lot.

Summary of Interview Results: The general results from the interview indicate that the respondents have little knowledge of key areas related to technology and key vocabulary in innovation and open learning. The interview also revealed that the respondent had little knowledge of technology and thus it can be determined that due to the limited knowledge that a gap does exists and that Indigenous Peoples are not rendered with opportunities that can help to increase their access to education .

Observation Results: During a two month (*n=3*) purposely selected schools in Toledo, a Southern district, that is populated by Maya were observed. The purpose of the visits was to observe the everyday practices of three Mayan school communities and how they used technology to foster educational growth and sustainability for the Indigenous Peoples (Maya). The field data collected was categorized based on three areas as noted below.

Observation of the Presence Technological Apparatus: *Table (3)* shows overall observations that were made as it relates to the presence of the following basic technological devices in the schools that were observed.

Technological Device	School 1	School 2	School 3
Computers	It was observed that school one – which is located in the most remote area of Toledo had five computers –they were located in the principal , secretary, accountant and vice principal's office . The teachers have no access to computers on the school's compound except for their own personal lap tops. The laptops however are not used to facilitate classroom lessons, but to type lesson plans only.	A total of 10 computers are located on the campus- five were distributed among the administrative offices, accountant and secretary. The remaining five were found in a small computer lab that the students used. During lab time it was observed that there were 4 to 6 students per computer. No individual student had access to his / her own computer	There were a total of 100 computers noted at these particular schools. The computers were shared among two students labs, an audiovisual room, administrative offices, accountant and secretary and a teachers' Staff Room
LCD- Projectors	There were no LCD Projectors present at the school-	No LCD Projectors were noted doing the visits to the school. The principal noted that they are thinking about purchasing one next year	There were four LCD Projectors
Radio	One Radio was noted	There were no radios	Each department had their own radio. A total of five were recorded. The radios use CD and not cassettes
Television	None	None	Three televisions were noted
Digital Cameras	None	None	Two cameras were recorded. There are used at school for school trips and other events, but not for teaching.

Summary of Other Observations Made During the Two Month Observation Period

During the visits to the various schools particularly school 1, it was observed that during heavy rainy days the school there were no classes because it was cut off from accessible roads and thus no busses of vehicular transportation could pass. It was also noted that during this time students were simply not sent or provided with any make up work, because most of the Indigenous children had no light or access to internet or computers. There was no evidence of any form of innovation present at school 1. Teachers taught all classes using basic chalk and talk methods, little visual aids and very teacher centered lessons. School 1 was also a multi-grade school, this means that three different grade levels were placed in the same class; however, the manner in which the teacher taught the lessons, she was only catering for one class level and the other levels were not included. There was one student who had a visual impairment and no accommodations were made for him. Conclusively, the overall observation of school 1 shows that the school does not practice innovative methods to reach, the Indigenous Population, who have little access to modern and open forms of learning. Furthermore, at school 2 there was more evidence of technology and some of the same practices that were observed at school 1. These practices include, cancellation of classes during rainy days, teacher centered classrooms with no use of technology. There was no evidence of innovative education, little to no plans for an increase in the presence of technology. Lastly school 3, was the most advanced in terms of technology and various use of methods to reach the students to ensure that the students are learning; however, the issue of innovation persisted, because once it rained continuously schools were called off and students did not received or do work that was missed. There was also little evidence of how the radios were used to enhance learning. I did not see the television nor the LCD projector or been used once while I visited the school.

Conclusion

The research shows that Indigenous Peoples continue to lag behind other populations globally. Key findings indicate that although there are many countries that offer Open Education, technological access and innovative opportunities there is still a significant number of Indigenous groups that remain cut off from the rest of the world. Lastly, if educational goals are to address the disparities that are evident in education policy makers need to find ways to ensure that Indigenous Peoples have equitable opportunities to grow. The research also indicates that:

1. The Maya of Belize have little knowledge of key areas related to technology, education, innovation and access.
2. The May of Belize, continue to be marginalized and educational opportunities are not distributed equitable.
3. There is little exposure to advanced technology and innovative education.

Recommendations

1. It is critical for governments globally , particular in countries such as Belize to adopt the Quality Teaching Indigenous Project (QTIP) that focuses on improving outcomes for Indigenous students in schools .
2. Increase teacher training in the use of technology and innovative methods in and outside of the classroom.
3. Increase skill based practical education in indigenous classrooms, as most groups are skilled with their hands but are not afforded many opportunities to put these skills into practice.
4. There is an urgency, globally to protect the cultural practices of the Indigenous Groups while they are seeking educational advancement, as these groups do not want to lose their culture; thus education should be tailored made to suit them.
5. Increase and improve road and transportation access, so that these groups can access schools during raining seasons and other wise.
6. Increase educational visits to ensure that the schools are maintaining and meeting educational goals stipulated by the country, MDGs and UNESCO.
7. Tracer studies need to be consistently conducted to monitor the retention and success rate of Indigenous Peoples.
8. Create mobile schools , computer labs and libraries that can travel to remote areas and provide access to technology, reading books and schools to name a few.

Reference

Aboriginal and Torres Strait Islander Social Justice Commissioner (2011). Social Justice Report 2011. Retrieve from https://www.humanrights.gov.au/sites/default/files/content/social_justice/sj_report/sjreport11/pdf/sjr2011.pdf>

Article 14, United Nations Declaration on the Rights of Indigenous PeopleS United Nations Declaration on the Rights of Indigenous. Retrieved June, 10, 2016 from http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

Bacow, L., Bowen, W., Guthrie, K., Lack, K., & Long, M. (2012). Barriers to adoption of online learning systems in U.S Higher education. USA: Ithaka S+ R.

Black, R., & Atkinson, J. (2007). Addressing the digital divide in rural Australia. Paper presented at the AusWeb07 conference, Coffs Harbor, New south wales, Australia. Retrieved from http://ausweb.scu.edu.au/aw07/papers/refereed/black/paper.html

Downing, R. (2002). Bridging Indigenous digital and learning divides: Report on Office of Learning Technologies support to Indigenous communities. Retrieved May 23, 2016, from http://www.hrsdc.gc.ca/en/hip/lld/olt/Skills_Development/OLTResearch/bridging-Indigenousdivide_e.pdf

Education at a Glance 2012 OECD indicators. Retrieved May, 23, 2016 from https://www.oecd.org/edu/EAG%202012_e-book_EN_200912.pdf

Katenies Research and Management Services & Chignecto Consulting Group (2006). Review of the Indian Studies Support Program component of the PSE program: Final report presented to the joint AFN-INAC PSE working group. Ottawa, ON: Assembly of First Nations. Retrieved March 26, 2007, from http://research.knet.ca/pdf/AFN_ISSP_Final_Report.pdf

Koissaba, B. R. (2013). Education for All: Prospects and Challenges of Mobile Schools, Mobile Education & E-Learning for Nomadic Pastoralists in Kenya.

Nickerson, M., & Kaufman, J. (2005). Indigenous culture in the digital age: Indigenous voice cultural working group paper. Retrieved May 21, 2016, from http://kta.on.ca/documents/IndigenousCultureinaDigitalAge.pdf

Resta, P. (2011). Policy brief: ICTs and Indigenous people. Retrieved July, 21, 2016, from UNESCO Institute for Information Technologies in Education, http://iite.unesco.org/pics/publications/en/files/3214689.pdf

United Nations Millennium Development Goals Report 2009. Retrieved June, 12, 2016 from http://www.un.org/millenniumgoals/pdf/MDG_Report_2012_ENG.pdf