



# **The Impact of Wireless Internet on STEM**

## **Education in Developing Nations**

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### **Inspiration**

A question that is the most often asked in a typical American household when a friend is visiting is, “What is your wifi password?” While certain population of the world today has the luxury to have access to wireless internet almost everywhere they go including cafes, workplace, and even the streets in major cities, 53% of the world still has no access to the Internet in any given situation (“ICT Facts and Figures 2016”, 2).

A question that is the most often asked in the UN when I say that I want to major in STEM at college is, “Then what are you doing at the UN?” It’s true. At first, the relationship between UN and engineering seem so far-fetched, but now in today’s age, they’re more interconnected than ever, and it is crucial that the United Nations utilize as much technology as it can. If the United Nations can provide humanitarian decisions and plans to improve the world, such as creating the Sustainable Development Goals (SDGs), modern technology can make it happen.

## **Current Situation of Internet in Africa**

### *Current usage of internet: Who, Where, and How*

An ongoing theme at the UN, especially during the two weeks of the high level political forum (HLPF) is to *leave no one behind*. Unfortunately, Africa, especially the sub-Saharan region is one of the most left behind nations in the world. Compared to United States, where 87.4 people out of 100 people are internet users, only 19.2 people of 100 people are internet users in sub-Saharan Africa. (World Bank, 2016)

## **The Work of UN**

With the establishment of the 2030 Agenda, it became clear that the role of technology is not only encouraged, but also necessary to the implementation of all 17 goals.

### *Addis Ababa Action Agenda*

Addis Ababa Action Agenda, written in 2015 at Addis Ababa, Ethiopia is one of the biggest step taken to improve technological integration into policy-making procedure. The Addis Ababa Action Agenda, provides a foundation for implementing the global sustainable development agenda that was reached by the 193 UN Member States attending the Conference, following negotiations under the leadership of Ethiopian Foreign Minister Tedros Adhanom Ghebreyesus. On the issue of greater integration of technology, countries agreed to establish a Technology Facilitation Mechanism at the Sustainable Development Summit in September to boost collaboration among governments, civil society, private sector, the scientific community, United Nations entities and other stakeholders to support the sustainable development goals. (Addis Ababa Action Agenda, 2015)

“We resolve to adopt science, technology and innovation strategies as integral elements of our national sustainable development strategies to help to strengthen knowledge-sharing and collaboration. We will scale up investment in science, technology, engineering and mathematics education, and enhance technical, vocational and tertiary education and training, ensuring equal access for women and girls and encouraging their participation therein.” (Addia Ababa Action Agenda, Paragraph 119)

The section upon technology perhaps provides the strongest connection between the STEM field and the field of international relations out of all of UN agreements written in history. The linkage between technology and education made, as stated in paragraph 119, is vital not only to *leave no one behind*, but also to form a long-term humanitarian development solutions.

*UN Population Fund (UNFPA)*

During a side event called, Inclusive and Equitable Education: Leaving No One Behind, in the week of HLPF, one of the panelists said, “It [education] has to be a system adapting to child, not a child adapting to the system.” STEM education in developing nations must be taught in a different manner than the way it is in the United States. While STEM education in advanced nations may look like biology and calculus, there are other subjects in much more dire need to be taught in sub-saharan African nations. STEM could look like midwives learning how to help childbirth, young mothers learning prenatal care, or children learning how to use a smartphone and the internet to communicate with the outer world more easily.

The UNFPA’s slogan is “Delivering a world where every pregnancy is wanted, every childbirth is safe and every young person's potential is fulfilled”. In order to achieve these

straightforward yet lofty goals, technological innovation as well as education is necessary in both the grassroots level and the governmental level. Currently, there are many smartphone applications in the works by the UNFPA to teach youth and women in the developing countries, ranging from subjects such as puberty and pregnancy. For example, “Youth Connect” is an application that educates the youth on puberty, and help them to talk to a professional over chat anonymously. There are topics on change of body for boys and girls, sex, and unplanned pregnancy. It allows them to search for a doctor, categorized by location, detailed with the head doctor and nurse’s names, availability of medicine, and phone number. In a conservative, developing nations where gender based violence and honor killings still take place frequently for premarital sex, the names of head doctor and nurse is necessary to build trust for the users. If they think that these professionals might know their parents, they can choose to visit another doctor to prevent a scandal and to an extent, their lives.

So how is this related to wireless internet, let alone STEM education?

User interface (UI) and user experience (UX) is extremely important when designing a website. It must be easy to use for users, especially in this case when users are not exposed frequently exposed to modern technology. The status of internet in developing nations is still weak, and even the minority that has the luxury of being able to use it is most likely to be wealthy, upper-class citizens who do not need humanitarian aid. Therefore, application must be available offline for the users to be able to access any time. For the population that do have smartphones, they are not as advanced as those used in advanced nations; therefore, they lack storage and it is likely that they will delete the largest application once they run out of storage for social media and games. It is crucial to make the app as light as possible while still having the

option of offline usage, but this is extremely difficult considering the mass of information they need to provide.

Once every part of the world can get access to wireless internet, both UI and UX can simultaneously be improved. Developers will have an easier time to build a light application and users will have a greater range of information they could access. This opens up multitudes of possibilities - checking the status of medicine, contacting a doctor in a foreign country for questions, and most importantly, having the access to education specifically in the STEM fields.

### *Obstacles and Negotiations*

Even when the infrastructure construction is running smoothly on the developer side, the biggest problem could be the actual implementation within developing nations - not only technical issues, but also political problems. (insert examples of negotiations with conservative countries)

Another rising issue is on the status of internet censorship and the lack of freedom thereof. In the African continent alone, 36 of 65 nations experienced a decline in internet freedom since 2013, especially upon journalism. Arrests for online communications were made in 38 of 65 nations, heavily in Middle East and North Africa (MENA) region, and threats toward women and marginalized groups are still continued.

“Within Africa, South Africa and Kenya are again considered to be ‘free’. In descending order of freedom, Nigeria, Uganda, Angola, Tunisia, Malawi, Zambia, Morocco, Libya, Rwanda, Zimbabwe, and Egypt fall in the ‘partly free’ region. Sudan, The Gambia, and Ethiopia are considered ‘not free’.” (OAfrica, 2016)

The conservative nature of governments poses a threat to the comprehensive usage of internet, especially regarding education. Censorship by the government can ease the spread of false knowledge and data, which makes better access to internet a counterintuitive process. STEM education requires high accuracy. People who lack previous knowledge cannot be introduced to false information, especially when it comes to medicinal studies, including sexual health, and technology.

Wireless Internet could be in the form of wifi, but it could also be cellular data connection. Every smartphone has a SIM card embedded in order to use cellular data where it has connections. For android, which is the most popular option for people saving up money for a cheap smartphones, SIM card is externally placed and users are able to take the card out and use it with a different cellular carrier, or even a SIM card of a different country's mobile carrier when the user is traveling. It's one of the most important components, and plays the role of making the smartphone "smart". Unfortunately, many sub-Saharan nations face heavy restrictions on the usage of SIM card and government's control, as well as access, of one's data. In Kenya, the SIM card registration regulations drafted in January 2014 will allow the communications regulator to have access to unfettered access to mobile network service providers' subscriber records without a court order. In Uganda, SIM card and mobile internet registrations continued through August 2013, despite concerns that the registration requirements infringe upon the right to privacy due to the lack of a necessary data protection law that will protect its users from the government. In Zambia, all unregistered SIM cards after the registration deadline of January 31, 2014 were disconnected. (,)

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