

Has the technology industry narrowed or widened the gap between opportunities available to citizens of rich and poor nations?

In 2016, the founder of the World Economic Forum, Klaus Schwab coined the term “the fourth industrial revolution¹” in foreseeing the next century’s perpetuation of technological development. Since then, in the wake of COVID and beyond, the innovations of the modern world have changed not only the technology industry but most other global industries too. With technological innovation comes opportunities and challenges which have vastly impacted nations of rich and poor. These challenges have provoked a controversial question; has the surge in technological development driven poor and rich nations away from each other? My thesis is that despite the global advancements of the third and fourth industrial revolution, yes, there is a widening inequality for opportunities available to citizens of poor countries compared to rich countries. Underlying this, is the disparity in access to basic technological infrastructure and the lack of funding toward technology for developing nations.

The digitization of the electronic world is the key change of the third industrial revolution² – the invention of the Internet itself could be argued as the most significant creation of the century. Although the third industrial revolution reduced inequality and provided access to education for developing nations, as discussed in Thomas Friedman’s book ‘The World is Flat’³, the newest technological revolution has re-widened the inequality gap. This is because the pace at which the developments are advancing in poor nations is slower than that of the rich nations. The disparity in the rate of advancement between the rich and the poor is best shown when splitting the technology industry into its main pillars – healthcare, education and finance. I will demonstrate this disparity by analysing each pillar of technology across the world.

Healthcare

The healthcare sector is one area in our world where technology is making a huge difference – with the fusion of medical sciences, computing and entrepreneurship, new formulations such as eye disease detection tools from Google⁴ and electronic medical records, the efficiency of healthcare systems have improved greatly. Having said this, an indicator for whether the technology industry is widening or narrowing the gap between opportunities available to citizens of rich and poor nations, is investigating how these formulations have been implemented and whether or not they are accessible to everyone.

Machine learning (ML) algorithms and Artificial Intelligence (AI) application have birthed an entirely new generation of healthcare devices and tools which have vastly improved the

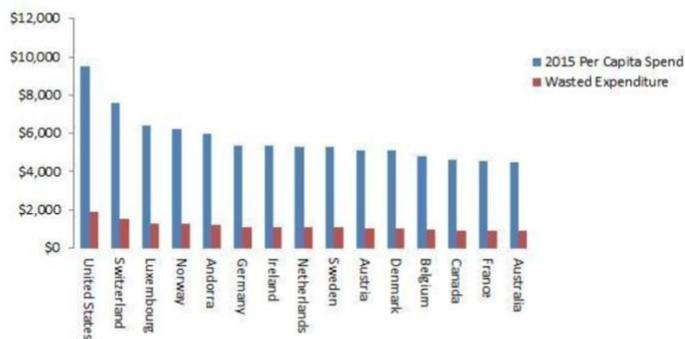
¹ <https://www.iberdrola.com/innovation/fourth-industrial-revolution>

² <https://trailhead.salesforce.com/en/content/learn/v/modules/learn-about-the-fourth-industrial-revolution/meet-the-three-industrial-revolutions>

³ Friedman, Thomas. *The World Is Flat*. USA, Penguin Books, 2005

⁴ <https://www.technologyreview.com/2020/04/27/1000658/google-medical-ai-accurate-lab-real-life-clinic-covid-diabetes-retina-disease/>

efficiency of diagnosis, clinical trials, drug development and other key aspects of healthcare systems⁵. Not only is AI and ML improving the efficiency of healthcare, but it is also reducing the cost for those who have access to it, namely rich countries. The technological tools used in healthcare can cut out post-treatment complications, unnecessary payments and reduce the chances of misdiagnosis ultimately reducing healthcare expenditure. The graph below indicates the average wasted expenditure per person of the top 15 countries (next to the 2015 Per Capita healthcare spend) which AI and ML aims to reduce.



Top 15 countries by per capita healthcare spend Image: EA analysis, World Bank Data

Image: EA Analysis, World Bank Data, World Economic Forum⁶

However, it seems that the developing countries have invested little to no money in AI for healthcare (or AI in general) which could be for a multitude of reasons, two of them being expense and inaccessibility. In 2019, the UK invested £250 million⁷ (\$330 million) for collaboration between AI technologies and healthcare, and many people can argue that there will always be a need to spend more. This highlights the sheer expense of technology for healthcare particularly for poorer nations, seeing as even the UK, one of the richest countries in the world, struggles to provide enough money for AI to be carried out fully in their national health service. According to a report from the World Bank and the World Health Organization⁸, “at least half of the world’s population cannot obtain essential health services.” Additionally, nearly 100 million people are forced into extreme poverty due to the health expenses being high. If countries such as the US and Switzerland, large investors in healthcare technology, are gaining access to some healthcare devices on top of their large Per Capita health spending (2019: Switzerland = \$7,732 US = \$10,966)⁹, the poorer nations (home to a large majority of those being forced into extreme poverty) are bound to fall far behind. It is evident that the countries that need health expense reduction the least are getting it the most, as a result of their access to AI thus outlining the significance of accessibility. Due to the fact that poorer countries are lacking in healthcare investments and do not have the same level of access to AI that richer countries do, the gap between opportunities available to citizens of rich and poor nations is widening in the health sector.

⁵ <https://www.weforum.org/agenda/2018/05/four-ways-ai-is-bringing-down-the-cost-of-healthcare/>

⁶ <https://www.weforum.org/agenda/2018/05/four-ways-ai-is-bringing-down-the-cost-of-healthcare/>

⁷ <https://www.forbes.com/sites/jamesomauroo/2020/12/10/uk-invests-250-million-to-lead-the-world-in-healthcare-ai/?sh=2e8cd64e7af2>

⁸ <https://www.who.int/news/item/13-12-2017-world-bank-and-who-half-the-world-lacks-access-to-essential-health-services-100-million-still-pushed-into-extreme-poverty-because-of-health-expenses>

⁹ https://www.healthsystemtracker.org/chart-collection/health-spending-u-s-compare-countries/#item-spendingcomparison_gdp-per-capita-and-health-consumption-spending-per-capita-2019

Education

The education sector is yet another example of an area where technology has changed the industry – the emergence of the global pandemic has accelerated the progress of Education Technology (EdTech), and the global intelligence platform for education HolonIQ, has estimated that the Global EdTech Market will reach \$404B by 2025¹⁰. Cher Ping Lim, A member of the Hong Kong Institute of Education, and his fellow education experts have concluded that there is a notable gap between the intensive use of technology outside versus inside a school environment¹¹. To take this conclusion further, it could be seen that this usage gap would hold a separate significance in countries where technology is used much less overall. In order to compare the technological advancements in different sectors accurately and systematically, it is important to again, investigate how EdTech has been implemented and whether or not it is accessible to all.

Whilst there is bound to be a small figure of students that are not benefitting from technological advancements in education within the rich countries (due to lack of funds, no access to basic infrastructure etc.), there is sufficient evidence to show that education technology is booming in the more affluent nations generally. For example, in 2018, although the country's economic growth was around 1.9%, Germany's e-learning market rate of growth was 8.5%¹². Another example of the flourishing of EdTech in the wealthiest nations, is the rise of Chinese e-learning websites such as Zuoyebang. Zuoyebang's market valuation is estimated at \$6.5 billion¹³ and is backed by numerous high-profile investors e.g., Alibaba Group, Goldman Sachs, Qatar Investment Authority.

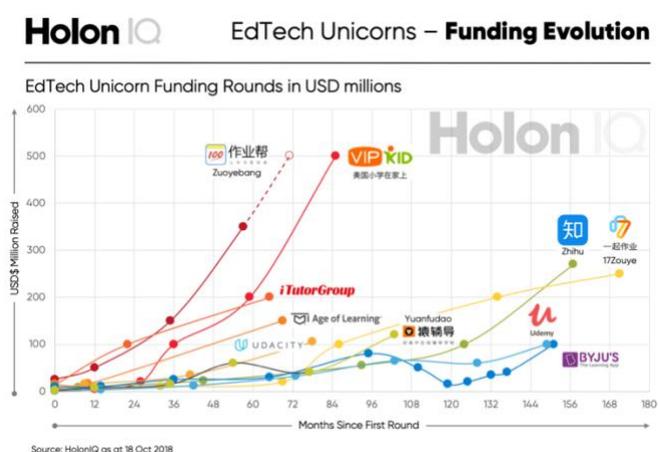


Image: HolonIQ¹⁴

Similarly, the US is charging forward in their EdTech innovations; the founder of one of the top online platforms used for education (Zoom), Eric Yuan's net worth rose to \$21.3 billion¹⁵

¹⁰ <https://www.holoniq.com/notes/global-education-technology-market-to-reach-404b-by-2025/>

¹¹ Cher Ping Lim, et al. "Bridging the Gap: Technology Trends and Use of Technology in Schools." *Journal of Educational Technology & Society*, vol. 16, no. 2, 2013, pp. 59–68. *JSTOR*, www.jstor.org/stable/jeductechsoci.16.2.59. Accessed 20 Feb. 2021.

¹² <https://www.guide2research.com/research/online-education-statistics>

¹³ <https://craft.co/zuoyebang>

¹⁴ <https://www.holoniq.com/edtech/anatomy-edtech-unicorn/>

¹⁵ <https://www.forbes.com/sites/sergeiklebnikov/2020/10/29/zoom-is-now-worth-more-than-exxonmobil-and-founder-eric-yuans-net-worth-has-nearly-doubled-in-three-months/>

to which there is no doubt is thanks to the mass use of his ingenious creation. It would be an understatement to say that education technology is being implemented in the topmost affluent nations successfully. This success is particularly visible when compared to the progress of education technology in less affluent nations. The humanitarian organization UNICEF has conducted research that shows that in many places, there is a “Lack of trained teachers, inadequate learning materials, makeshift classes and poor sanitation facilities [which] make learning difficult for many children.”¹⁶ Whilst most of the large e-learning platforms are free and therefore aid those who may struggle to collect the funds for online school, the children who don’t have access to the basic devices required for these online platforms trail behind even further. Pew Research Center’s statistics show that in 2015, in emerging/developing nations such as Uganda, Tanzania and India, two-in-ten or fewer people have access to the internet occasionally or own a smartphone (Uganda = 15%, Tanzania = 19% and India = 20%)¹⁷. Although this data may be slightly outdated, this information was recorded a few years into the fourth industrial revolution indicating that the emergence of advanced technology has not benefitted developing nations to the same level as it has the richer nations. If these developing nations already have a low percentage of people who have access to devices, the percentage of those who have access to online schooling will also be low. The data provided by the United States Census Bureau shows that in America, “Nearly 93% of households with school-age children report some form of distance learning during covid 19”¹⁸. Using this data and similar information surrounding other affluent nations alongside the suggested difference in the implementation of EdTech in the rich nations versus the poor, it could be said that the technology industry’s positive impact on the education sector of rich nations is larger than the impact on the poor nations thus providing opportunities for the citizens of the affluent nations more so than the less affluent.

Finance

Finally, the third sector which technology has elevated is the financial sector – some examples of financial technology (FinTech) that has boosted the industry are Robotic Process Automation (automating repetitive manual processes) and Blockchain (decentralization platform of cryptocurrencies). In my view, out of the three sectors discussed, the technological innovations in the financial sector have aided third world countries the most as FinTech has allowed for families in these nations to make safe and wise choices financially through the administration of digital financing. The digitization of financing (microfinancing in particular) has opened doors for people living in developing countries through enabling mobile money, loans and the ability to make an interest. Lisa Kienzle’s article for Next Billion states that “Mobile money services are available in 60 percent of developing countries and 16 now have more mobile money accounts than bank accounts”¹⁹ which displays the success of digital financing for poor nations. Jin-Yong Cai, Executive Vice President and CEO of International Finance Corporation, advocates that “the benefits of digital finance extend well beyond conventional financial services: this can be a

¹⁶ <https://www.unicef.org/education>

¹⁷ <https://www.pewresearch.org/global/2015/03/19/1-communications-technology-in-emerging-and-developing-nations/>

¹⁸ <https://www.census.gov/library/stories/2020/08/schooling-during-the-covid-19-pandemic.html>

¹⁹ <https://nextbillion.net/microfinance-goes-digital/>

powerful tool and an engine for job creation in developing countries.”²⁰ Although mobile money and digital finance has added momentum in the creation of opportunities to citizens of poor nations financially, the technological innovations for the rich are still charging forward because they have access to tools that require a minimum sum of money that the majority of members in developing countries don’t have.

As newer banks have seen mass success in going digital, even the oldest banks are beginning to follow suit. This digitization is being implemented in private-members banks for the richest 1% of the world as seen in the Swiss company Alpian²¹. Alpian uses an authentic approach whereby the user’s investments are managed carefully, and additional elite investment tools are provided in an app. These users own a minimum sum of money which is significantly more than what most people in developing nations own, as there are conditions to using the elite banking service. Alpian is just one example of the use of FinTech in supplying the elite members of affluent countries investment advice and management. This use of FinTech, despite its positive impact on developing nations, allows for the richest nations to prosperously progress in their opportunities available whilst the third world is moving far slower.

Conclusion

The innovations made available by the growing technology industry and the progression through the fourth industrial revolution has created opportunities for citizens of the globe – rich and poor alike. Nevertheless, whilst the poorer nations “play catch-up” on digitization in all three sectors (healthcare, education and finance), the richer nations continue to enhance daily life with state-of-the-art technology that allows those sectors to flourish with sophistication and ease. Technology brings families of developing nations basic financial aid and healthcare, meanwhile modern inventions such as the Amazon supermarket²² and 5G are enacted in the rich nations. In the final analysis, it can be seen that the rate at which technology is implemented in the poor nations is slower than that of the rich nations which widens the gap of opportunities available to citizens. Klaus Schwab’s well-known saying that “in the new world, it is not the big fish which eats the small fish, it’s the fast fish which eats the slow fish” encapsulates the significance of the rate at which technology is implemented.

²⁰ <https://www.worldbank.org/en/news/feature/2014/04/10/digital-finance-empowering-poor-new-technologies>

²¹ <https://sifted.eu/articles/private-digital-bank-raise/>

²² <https://www.bbc.co.uk/news/technology-56266494>