COMMENTARY

Africa must create centres of educational excellence for innovation and development

DOI: 10.29063/ajrh2024/v28i7.2

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Abstract

This paper explores the following development questions that perplex most Africans: "Why do African countries rely on foreign companies and foreign experts for almost all our development projects? Why can't we build our own roads, process our own food, and mine our own minerals, oil, and gas? Why don't we have world-class hospitals and industries? How can we have so much natural wealth and yet be so poor? Why do we invent so little?" The answer lies in our failure to implement idea number two. There are two major ideas in educational policy. **Idea number one** is the obligation to educate all children because it is their fundamental human right as enshrined in the 1948 United Nations Declaration of Human Rights. **Idea number two** is the strategy of establishing and sustaining world class schools and universities for the education of the most highly gifted and highly talented citizens. Developed countries deploy both ideas aggressively. Underdeveloped countries in Africa have not implemented idea number two. Countries that have deployed idea number two have at least one university ranked among the top 200 in the world. The presence of great universities (top 200) in a country is a 21st century indicator of the presence of high levels of innovation, technology, development and wealth in that country. According to the three major rankings of world universities (Shanghai-ARWU, THE, and QS-topuniversities.com), none of the world's top 100 great universities is in Africa. Although Africa was a pioneer among the continents in innovations such as human language, domestication of fire, making of tools, invention of agriculture, development of writing, and creation of great centers of learning in ancient times, it has fallen behind other continents over the last 500 years and it has been disrupted by enslavement and colonization, and the structural adjustment programs (SAPs) of the IMF and the World Bank. Ancient African centers of innovation included the Ancient City of Benin and Timbuktu in Western Africa, the Kingdom of Kush and ancient Egypt in northern Africa, Axum in Eastern Africa, Mapungubwe and Great Zimbabwe in Southern Africa, and the Kingdom of Kongo in central-Africa. An African renaissance will only occur when we implement idea number two by establishing world class schools and at least one great university per African country. *(Afr J Reprod Health 2024; 28 [7]: 17-29).*

Keywords: Two ideas in education, great universities, world class schools, innovation, technology, development, disruptions, structural adjustment programs (SAPs)

Résumé

Cet article explore les questions de développement suivantes qui intriguent la plupart des Africains : « Pourquoi les pays africains s'appuient-ils sur des entreprises et des experts étrangers pour presque tous nos projets de développement ? Pourquoi ne pouvons-nous pas construire nos propres routes, transformer nos propres aliments et extraire nos propres minéraux, pétrole et gaz ? Pourquoi n'avons-nous pas d'hôpitaux et d'industries de classe mondiale ? Comment pouvons-nous avoir autant de richesses naturelles et pourtant être si pauvres ? Pourquoi inventons-nous si peu ? La réponse réside dans notre échec à mettre en œuvre l'idée numéro deux. Il y a deux idées majeures en politique éducative. L'idée numéro un est l'obligation d'éduquer tous les enfants, car il s'agit de leur droit humain fondamental tel que consacré dans la Déclaration des droits de l'homme des Nations Unies de 1948. L'idée numéro deux est la stratégie consistant à créer et à maintenir des écoles et des universités de classe mondiale pour l'éducation des citoyens les plus doués et les plus talentueux. Les pays développés déploient ces deux idées de manière agressive. Les pays sous-développés d'Afrique n'ont pas mis en œuvre l'idée numéro deux. Les pays qui ont déployé l'idée numéro deux comptent au moins une université classée parmi les 200 meilleures au monde. La présence de grandes universités (les 200 meilleures) dans un pays est un indicateur du XXIe siècle de la présence de niveaux élevés d'innovation, de technologie, de développement et de richesse dans ce pays. Selon les trois principaux classements des universités mondiales (Shanghai-ARWU, THE et QS-topuniversities.com), aucune des 100 meilleures universités mondiales ne se trouve en Afrique. Bien que l'Afrique ait été un continent pionnier en matière d'innovations telles que le langage humain, la domestication du feu, la fabrication d'outils, l'invention de l'agriculture, le développement de l'écriture et la création de grands centres d'apprentissage dans l'Antiquité, elle a pris du retard sur les autres continents au fil du temps. Ces 500 dernières années ont été perturbées par l'esclavage et la colonisation, ainsi que par les programmes d'ajustement structurel (PAS) du FMI et de la Banque mondiale. Les anciens centres d'innovation de l'Afrique comprenaient l'ancienne ville du Bénin et Tombouctou en Afrique de l'Ouest, le royaume de Kouch et l'Égypte ancienne en Afrique

du Nord, Axum en Afrique de l'Est, Mapungubwe et le Grand Zimbabwe en Afrique australe et le royaume de Kongo en Afrique centrale. . Une renaissance africaine ne se produira que lorsque nous mettrons en œuvre l'idée numéro deux en créant des écoles de classe mondiale et au moins une grande université par pays africain. *(Afr J Reprod Health 2024; 28 [7]: 17-29).*

Mots-clés: Deux idées en éducation, grandes universités, écoles de classe mondiale, innovation, technologie, développement, perturbations, programmes d'ajustement structurel (PAS)

Introduction

Africa is currently the world's least developed continent.[1] Almost all the 54 countries of Africa continue to remain desperately poor despite having huge resources of arable land, oil, gas and a diverse range of important minerals that are essential to global industries. Because of low technical capacity and the absence of large mining and engineering companies and industries, Africans continue to:

1. Bring in foreign companies to build the roads and the railways
2. Bring in foreign companies to locate minerals, oil, and gas
3. Bring in foreign companies to mine the minerals, oil, and gas
4. Bring in foreign companies to refine the minerals and oil
5. Bring in foreign companies to generate electricity
6. Bring in foreign companies to build and manage telecommunications
7. Bring in foreign companies for commercial production and processing of food
8. Export raw materials instead of high value manufactured products
9. Import all advanced electronics and machinery – nothing advanced is manufactured locally
10. Rely on foreign companies for our pharmaceutical products and healthcare devices

This reliance on foreign companies and experts continues to perplex most thoughtful Africans.

The three classical factors of production in economics are land, labour, and capital. There is now a fourth factor of production, and that is knowledge.[2,3] And it is the key strategic resource and driver of socio-economic development and wealth-creation in today's knowledge economy.[2,3] Throughout human history, socio-economic development and wealth creation have been directly derived from knowledge, i.e., from new ideas, new social re-organizations, new scientific discoveries, and new technological innovations. This means that societies or countries that leap forward in terms of knowledge production, accumulation, application, and dissemination have been able to develop faster and to pose existential threats to societies or countries that fall behind in the accumulation of knowledge, know-how or technology.[3-9] The two defining European disruptions of Africa of the last 500 years, i.e., enslavement and colonization, whose negative consequences Africans still suffer from today, occurred because Africa fell back as Europe leapt forward in the spheres of knowledge and knowledge-based technological innovations of the European Age of Discovery, the European Enlightenment, and the European Industrial Revolution.[10-13,7]

In his classic book on *"The Civilizations of Africa,"* the historian Christopher Ehret notes that Europeans tried to conquer African societies for a long time, but only succeeded in the nineteenth century "because of two elements of military ordnance invented only in the second half of the nineteenth century, the repeating rifle and the gatling gun, a precursor to the machine gun." [13] Put another way, the European invention of weapons that were superior to the African weapons of the time played a major role in the success of European colonization of Africa. This knowledge gap that led to the two great European disruptions of Africa, i.e., enslavement and colonization has not closed and will not close until African countries realize that they must establish great universities as centers for innovation, technology, and development.

In his 2010 book *"A Marketplace of Ideas"* on the history and achievements of great American universities, Louis Menand has written that,

"Knowledge is our most important business. The success of almost all our other business depends on it, but its value is not only economic. The pursuit, production, dissemination, application and preservation of knowledge are the central activities of a civilization…. Knowledge is a form of capital that is always unevenly distributed, and people who have more knowledge, or greater access to knowledge, enjoy advantages over people who have less.[5]

Louis Menand is referring to an inevitable global economic Darwinian reality in which societies or

countries with "more knowledge, or greater access to knowledge, enjoy advantages over people who have less" knowledge.

In *"The Wizard of the Crow,"* Ngugi wa Thiong'o reflects on the same global economic Darwinian reality by asking,

"Why did Africa let Europe cart away millions of Africa's souls from the continent to the four corners of the wind? How could Europe lord it over a continent ten times its size? Why does needy Africa continue to let its wealth meet the needs of those outside its borders and then follow behind with hands outstretched for a loan of the very wealth it let go? How did we arrive at this, that the best leader is the one that knows how to beg for a share of what he has already given away at the price of a broken tool? Where is the future of Africa?"[14]

To Ngugi's question, "How could Europe lord it over a continent ten times its size?" The answer is that it is not physical size or population size that is the main determinant of the ability of one nation or country "to lord it over" another nation or country; it is the size of brainpower or knowledge-power (for which presence or absence of great universities is an indicator) that is the main determinant of success in the ugly Darwinian business of "lord[ing] it over." The winners in this Darwinian competition are the developed countries that have implemented two important ideas on the question of how to educate their citizens.

There are two empirical ideas in educational policy

Idea number one is the obligation to educate all children because it is their fundamental human right as enshrined in the 1948 United Nations Declaration of Human Rights. Nowadays all countries implement this idea.

Idea number two is the strategy of establishing and sustaining world class schools and universities for the education of the most highly gifted and highly talented citizens. This idea number two is based on the 80/20 pareto principle.

Developed countries deploy both ideas aggressively. Underdeveloped countries in Africa have not implemented idea number two. Countries that have implemented idea number two have at least one university ranked among the top 200 in the world. The presence of great universities (top 200) in a country is a 21st century indicator of the presence of high levels of innovation, technology, development, and wealth in that country. According to the three major rankings of world universities, none of the world's top 100 great universities is in Africa (Shanghai-ARWU, Times Higher Education World University Rankings, and QS-topuniversities.com).[15,16,17]

The 900-year open secret: Let us do what the developed world is doing, not what they tell us to do

How have countries like India, Singapore, South Korea, Taiwan, China, and Israel that were as poor as African countries 60 years ago, deployed educational strategies to foster effective leadership, research, inventions, innovations, industrialization, growth, and development?

They have done so by emulating an open secret, i.e., idea number two.

This idea number two leads to the production of a critical mass of experts in all spheres of society and the economy including leadership. For a country to develop it must have both the capacity for effective leadership in all institutions and technological competence. The open secret of the world's best universities is that they have continued to produce both great engineers and great thinkers capable of organizing societies, building and leading highly productive institutions and corporations, and governing their countries properly.

The main point of idea number two is that there is a need for excellence in all spheres of knowledge which are the humanities, the social sciences, the natural sciences, and technology.

This open secret was borrowed by all successful countries including the USA from the home of the great industrial revolution which is Great Britain or the UK. Although Britain has over 160 universities, it has continued to uphold Oxford and Cambridge as the gold standards for excellence for over 800 years. Oxford University was established over 900 years ago, and it is still ranked among the top 5 universities in the world today.[16]

The open secret is that for a country to have a genuine functional education, it must have a two-sided strategy that is based on the pareto principle of 80/20. Less than 20% of any randomly selected population will have genius or exceptional abilities. Also, as stated by the pareto principal 20% of effort or 20% of individuals usually produce 80% of

desired output or impact. Most human beings in all countries will be of average height and average intellectual and physical abilities. The statistical bell curve or normal distribution curve is a correct description of most natural realities.

Any country that wants to succeed must provide education for 80% of its population that is of average ability (idea number one), but it must also, at the same time, provide education of extremely high quality and high challenge for the other 20% that is exceptionally highly gifted and highly talented (idea number two). This is the better meaning of inclusion. Education for the 80% and education for the 20% in institutions that maintain symbiotic collaborations.

The 80% and 20% cannot be educated in the same classroom. This is the open secret that the UK has implemented for over 900 years, and clever countries have emulated, while African countries have not. When the 20% are educated in the same classrooms, they get bored and drop out or misbehave. There is not enough challenge and insight for them in the ordinary classroom that is designed for the average student. And their gifts and talents will not be developed to the highest possible levels. This is why most high schools and most universities in the USA have honours programs for the 20% in their institutions.

You cannot train the great Kenyan runner Eliud Kipchoge to run in the same running camp as this author. That will not be good for Eliud Kipchoge, and it will not be good for this author. Even though both are runners. You cannot train the great footballer Kylian Mbappé in the same football academy as this author. That will not be good for Mbappe, and it will not be good for this author. Even though both are football players. Eliud Kipchoge and Mbappe will regress to the mean.

An equally important additional reason for the 80/20 strategy is that there are not enough resources in a developing country to provide an excellent education or a personalized education to everyone at all levels. When resources are limited, it is wise to prioritize.

The other part of the open secret is that it should be the best in class that become teachers, just as the best in class become doctors and engineers.

A country should not put classroom teachers who do not understand mathematics in charge of providing a foundation for mathematics or STEM in lower primary schools. It is a well-qualified teacher who is proficient in mathematics that should be teaching mathematics in all grades including primary school GRADE ONE.

To those who will quickly dismiss this proposal for emulating the open secret, i.e., the 80/20 two-sided educational strategy of the highly developed countries as elitist and undemocratic, they should note that the 20% are not children of the rich or the upper classes only. They are highly gifted children and adults from all socio-economic classes. From the poorest classes to the middle classes to the upper classes. From the servant's family and from the King's family.

When countries or kingdoms fall behind in technology they are conquered

In thinking about the role of great universities in saving "the future of Africa", it is important to take a comparative view and to note that China and India and many other countries or kingdoms also did fall behind Europe in the last 500 years, and to look at how China and India and other formerly-controlled or formerly-colonized countries have focused on establishing and sustaining great universities in order to ensure that they leap forward in knowledge and technology in order to develop, create-wealth and protect themselves.[18,19] In his 2017 bestseller *"The Inglorious Empire,"* Shashi Tharoor writes of the disruption of India by the British,

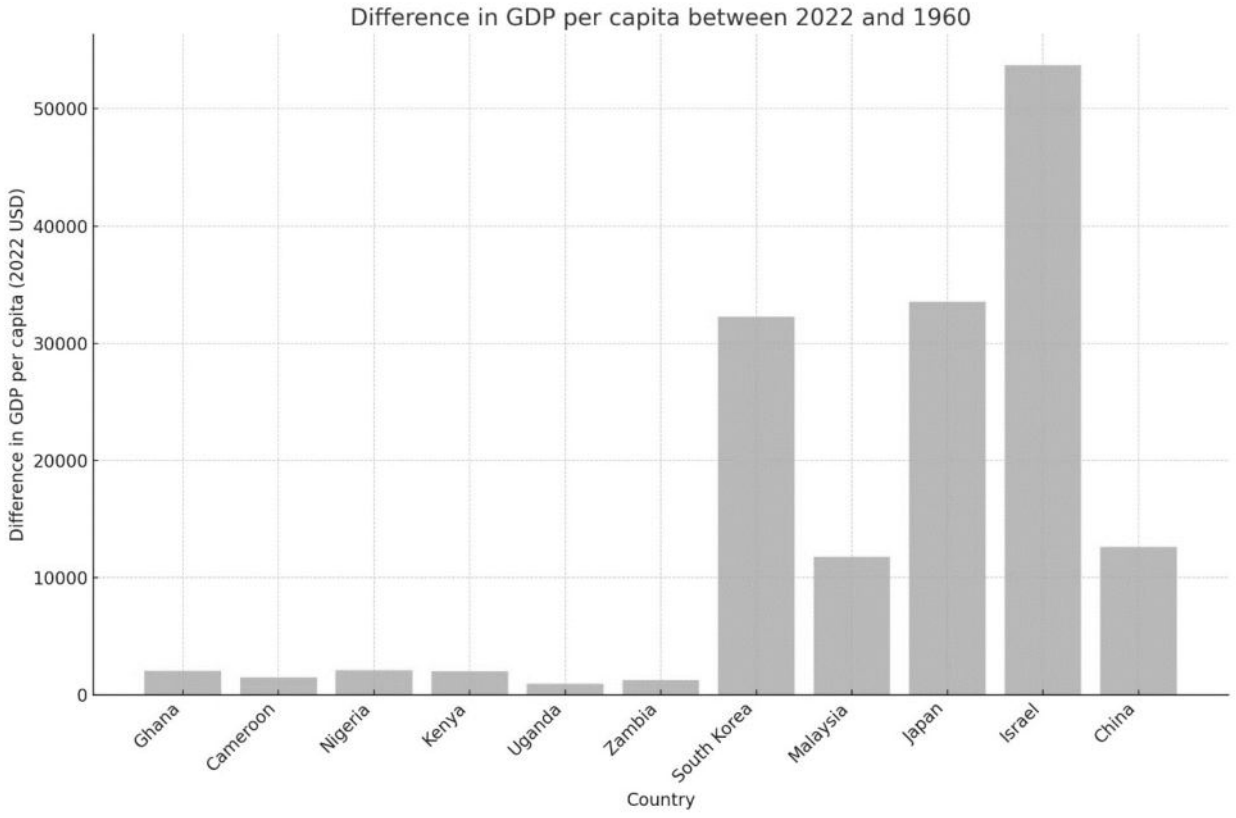
"taking advantage of the collapse of the Mughal empire and the rise of a number of warring Principalities contending for authority across eighteenth-century India, the British had subjugated a vast land through the power of their artillery and the cynicism of their amorality….At the beginning of the eighteenth century…India's share of the World economy was 23 per cent, as large as all of Europe put together….By the time the British departed India, it had dropped to just over 3 per cent. The reason was simple: India was governed for the benefit of Britain. Britain's rise for 200 years was financed by its depredations in India."[9]

Just as Europe, to use Louis Menand's phrase, did use knowledge to "enjoy advantages" over African societies, Europe did the same to societies in India as noted by Tharoor[9] and China, Japan, Malaysia, Latin America, and other parts of the world.

Wealth Creation for Selected Countries with and without Great Universities

Table 1: Wealth-Creation as Change in GDP per capita with 1960 compared to 2022 (in 2022 USD) for a Selection of Countries with Great Universities Compared with African Countries without Great Universities. Source World Bank Data at: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?end=1960&locations=KR-GH-JP&start=1960&view=bar

Country	1960 GDP per capita in 2022 USD	2022 GDP per capita in 2022 USD	Great Universities Among Top 500 of ARWU 2023
Ghana	177.09	2,203.6	0
Cameroon	120.02	1,563.5	0
Nigeria	93.40	2,162.6	0
Kenya	102.08	2,099.3	0
Uganda	55.53	964.4	0
Zambia	228.57	1,456.9	0
South Korea	158.27	32,422.6	12
Malaysia	244.61	11,993.2	2
Japan	475.32	34,017.3	17
Israel	1,229.17	54,930.9	6
China	89.52	12,720.2	45



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Despite China's earlier lead as the great discoverer of gunpowder, the compass, papermaking, and printing, China was successfully outwitted by the British who had managed to leap ahead of the Chinese in new knowledge and in industrial capabilities. It is newly acquired superiority in knowledge that enabled the British to take control of Chinese Hong Kong for 156 years, from 1842 to 1997.[19]

This comparative view is an important reminder that there is nothing genetically wrong with Africans. Whoever falls behind, whether they are Chinese or Indian or European or African will be enslaved or colonized or conquered.

Global rankings of universities and the talent age

According to the three major rankings of world universities which are Shanghai-ARWU, Times Higher Education, and QS-topuniversities.com[15-17] none of the world's top 100 great universities is in Africa. There is a strong correlation between having great universities and having great production of new knowledge as measured in annual patent applications, patents granted, copyrights, and research publications in top-rated journals. Countries that do not have any universities ranked among the world's top 200 great universities also do not have high output in annual research productivity, patents of new inventions, copyrights, and innovations. And, also, there is a strong correlation between establishing and sustaining great universities and exiting poverty as measured in GDP per capita (See Table 2).

The American journalist and thinker Thomas L. Friedman sees a qualitative difference between the economies of the past, and those of the 21st century and describes the same phenomenon of the ascent of knowledge that has made the presence of great universities an essential dimension for national competition by calling today's Darwinian global knowledge economy the talent age:

"Although knowledge has always mattered, it matters more than ever today….until the scientific revolution of the seventeenth century, virtually everyone everywhere was living on the edge of subsistence. But after three centuries of technological and scientific advances, subsistence is no longer the norm. Steam power, machine tools, electricity, and ultimately computers and the Internet have enabled individuals to become vastly more productive. So now the Industrial Age and the Information Age are giving way to the Talent Age[20]

China's strategic Darwinism is a sharp contrast to Africa's current blindness to survival

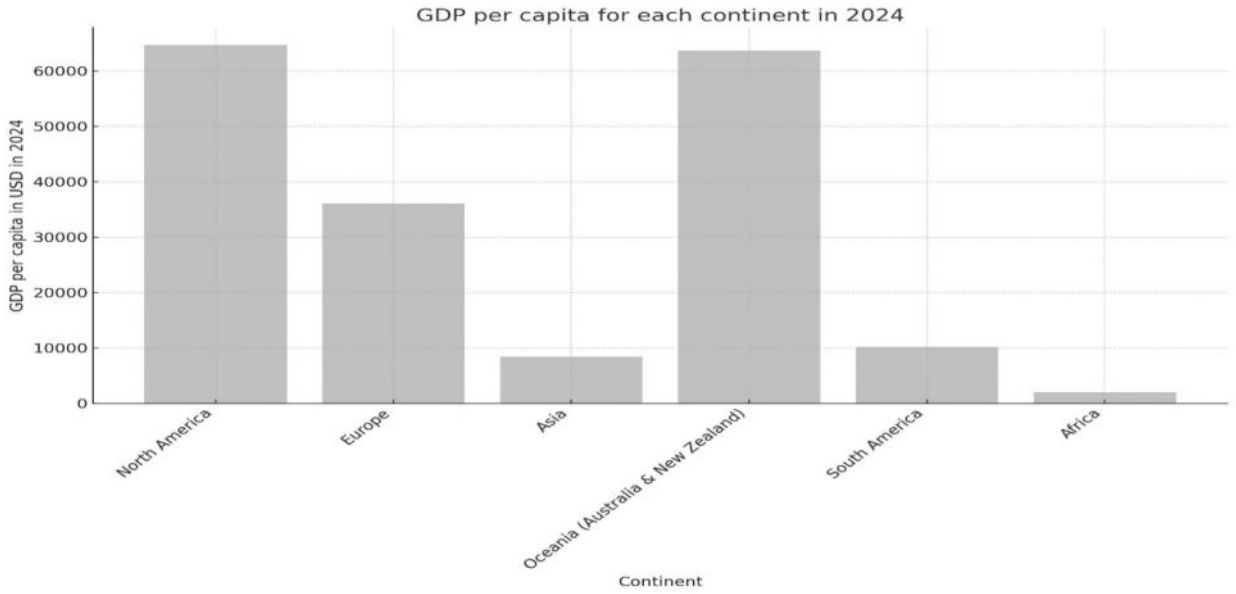
The scholar of China, Michael Pillsbury[19] explains that Chinese leaders use the term Darwinian in their discussions about China's need to recover from past humiliations and to take over global superpower status from America, and *that Chinese leaders translate Darwin's concept of "natural selection" into Mandarin as "elimination" of inferior races*. The Chinese, according to Pillsbury, have launched a "one hundred-year marathon strategy" to overcome what they see as an unfair inferiority that was imposed upon them by the West beginning with the First Opium War of 1839 when the British Royal Navy defeated the Chinese.[19]

In his highly enlightening 2017 book titled *"The Deals That Made The World,"* Jacques Peretti[21] reports that China is so strongly focused on reclaiming its past glory of over 3,000 years ago, that it has already built its own excellent and better versions of the best of 21st century Western technology companies: Weibo in place Twitter; Baidu in place of Google; Alibaba in place of Amazon; WeChat in place of WhatsApp, Facebook, Apple Pay and Google-News combined; Didi in place of Uber; and Huawei and Xiaomi in place of Apple. Peretti also reports that "GWC is a Sino-Japanese company with ambitions that make Silicon Valley tech giants look modest…. GWC is scaling up tech entrepreneurship to industrial grade with the aim of producing 20,000 Elon Musks[21] These great Chinese intellectual and technology strategic achievements are part of a self-conscious Chinese effort to build "the new Silk Road", also known as OBOR or "One Belt One Road." OBOR was launched in May 2017.[21]

The current absence of great universities in Africa, and the current lack of serious plans for establishing or funding and maintaining great universities in Africa is in sharp contrast to China's strategic Darwinism which now includes control of virtually all major African infrastructure projects including the Headquarters of the African Union in

Table 2: Continents with great universities have much higher GDP and GDP per capita compared with continents without great universities. IMF World Economic Outlook 2024 at: https://www.imf.org/external/datamapper/NGDPD@WEO/OEMDC/ADVEC/WEOWORLD/GRL/AFQ

	Number of Univ. in Top 100 ARWU 2017	GDP in Billions of USD in 2024 (IMF)	GDP per capita in USD in 2024
Continents			
North America	52	33,160	64,580
Europe	34	26,470	36,060
Asia	8	38,460	8,350
Oceania (Australia & New Zealand)	6	2,050	63,610
South America	0	4,340	10,140
Africa	0	2,810	1,960



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Ethiopia. This example of strategic blindness to historical global economic Darwinism, is captured in a 29th January 2018 report by the Financial Times of the UK which stated: "African Union officials have accused China of hacking its headquarters' computer systems every night for five years and downloading confidential data. Beijing funded the AU's $200m building in Addis Ababa, Ethiopia, while a Chinese state-owned company built it."[22]

The Structural Adjustment Programs of the IMF and World Bank damaged African education

The Structural Adjustment Programs or SAPs of the World Bank and IMF of the 1980s and 1990s and the continuing narrative of aid have damaged the quality of African universities. The SAPs forced African countries to stop or reduce dramatically the public funding of universities.[23,24,25]

Before the SAPs rolled in, many African countries had high quality public universities that were well funded, with well-paid academic staff that were dedicated to teaching, research and community engagement, and students attended freely and got excellent education with the understanding that they will pay back through providing the country with knowledge-power or brain-power that is a necessary ingredient for development and sustainability.[26] Countries and societies that have created wealth and developed in the last 500 years have done so because

they have maintained this model of providing their youth with access to top quality education for "free," where free is not really free because they pay back through contributions to innovations, wealth-creation, and taxes.[18,8]

Before the IMF and World Bank Structural Adjustment Programs or SAPs, African universities like Makerere of Uganda, Ibadan of Nigeria, UNZA of Zambia, and University of Nairobi of Kenya, were on a trajectory towards becoming world-class institutions. The quality of Makerere and the conditions under which students lived were such that they could concentrate on intellectual work because all their basic needs such as food, shelter, healthcare, and physical safety were catered for. Ngugi wa Thiong'o wrote his first two classic novels *The River Between* and *Weep Not Child* as an undergraduate at Makerere. This is unimaginable for the undergraduate students of Makerere today; not because they are less intelligent than Ngugi, but because Abraham Maslow[27] was right in his findings that creativity and problem solving belong to the category of self-actualization which can only be pursued after all the more basic needs (physiological, safety, love, and esteem) have been catered for. Students who are desperately looking for food cannot create classic novels in their dorms as Ngugi did at Makerere, or create Microsoft and Facebook in their dorms as Bill Gates and Mark Zuckerberg did at Harvard.

According to WIPO, in 2022, tiny Israel had more patents registered than all the 54 countries of Africa combined.[28]

When it comes to research and research publications, all of Africa produces only 2% of the world's research output. And 90% of the 2% comes from South Africa.[29]

World Intellectual Property Organization or WIPO

Country	Patents (WIPO 2022)
Israel	17,327
Egypt	866
Ghana	11
Kenya	396
Nigeria	16
Zambia	14

Ten case studies of countries that have developed by investing in world class schools and great universities:

Case study number one: India

Let us start with a quick view of what Indians born and educated in India are doing at the very top of the world of technology and commerce and education in the world's most powerful economy, the United States of America:

1. The CEO of Microsoft is Mr. Satya Nadella, born and educated in India.
2. The CEO of Google is Mr. Sundar Pichai, born and educated in India.
3. The CEO of IBM is Mr. Arvind Krishna, born and educated in India.
4. The CEO of Adobe is Mr. Shantanu Narayen, born and educated in India.
5. The CEO of Starbucks is Mr. Laxman Narasimhan, born and educated in India.
6. The Dean of Harvard Business School is Prof. Srikant Datar, born and educated in India.

This Indian success at home and abroad was not an accident. It is the fruit of the long-term vision and two-sided 80/20 education strategy of Indian leaders who have established and sustained highly selective and heavily funded world-class institutions, starting at the time of independence when India was a very poor country.

When India was planning a future of true independence for itself in the 1940s, its leaders deliberately set out to establish the Indian Institutes of Technology (IITs) modelled on America's M.I.T. which is the world's best comprehensive university of technology, and this is openly stated in the official history of the Indian IITs in the website of the Council of IITs. The role of these IITs in launching India as the main source of the world's best information technology, artificial intelligence, and engineering talent is now well known worldwide. The Indian government started with 4 IITs and has now expanded them to a total of only 23 for its vast population of over 1.4 billion.

The competition for the merit-based admissions to the 23 IITs is so intense that many times a score of 95% in mathematics in the Joint Entrance Examination (JEE) is not good enough for one to join the IITs. Gifted students spend thousands of hours preparing for the entrance examination from an early age.

Although India has a total of over 1,000 universities for the education of its vast population of over 1.4 billion, it maintains a special focus and investment in the 23 IITs for educating its most gifted and talented citizens. Emulating the UK and USA, India has applied the two-sided 80/20 strategy to both its universities and schools. Although India has many thousands of secondary schools, it maintains a few highly selective secondary schools modelled on Eton and Harrow of the UK, and the best magnet public schools of the USA such as Bronx Science and Brooklyn Latin and the California Academy for Maths and Science.

The overall result is that India has successfully established knowledge-and-innovation clusters that have industrialized India and pulled out hundreds of millions of Indians out of poverty. India has one of the world's largest pools of engineers, technologists, artificial intelligence (AI) experts, and thinkers. The world now depends on India for R&D, and top talent and top-quality offshore work in global capability centres.[30]

Case study number two: South Korea

South Korea's great GDP arises from the success of its many global brands which include Samsung, Hyundai, Kia, and LG. And which would not have existed without South Korea's strategic investment in top quality functional education.

Although South Korea has about 200 universities for its population of 52 million, like India, South Korea has emulated the two-sided 80/20 strategy of the USA with its ivy-leagues, and of the UK with its Oxford, Cambridge, and the Russel group of 24 excellent world-class universities.

South Korea has a special investment in keeping only 5 of its universities among the world's top 100 universities. The best of these 5 is Seoul National University and Korean Advanced Institute of Science and Technology.

And like the other developed countries South Korea has highly selective world-class secondary schools for the education of its most gifted and most talented children.

Because of South Korea's focus on establishing world-class universities and an ecosystem of research, innovation and manufacturing, South Korea has a nominal GDP of 1.7 trillion dollars which is almost 16 times higher than Kenya's nominal GDP of only 113 billion dollars for a population of the same size.

Although the GDP of South Korea in 1960 was actually less than that of Ghana and Zambia, today, in 2024, Ghana and Zambia remain desperately poor with GDPs per capita around 2,000 dollars per year, while that of South Korea is over 30,000 dollars per capita.[31]

Case study number three: Japan

When Japan realized in 1868 that it had fallen behind Europe and North America in terms of science, technology and industry, Emperor Meiji of Japan launched the Meiji Restoration and the establishment of the University of Tokyo (formerly Imperial College) as a centre piece of the long-term strategy to catch up with the west. The scholar Joel Kotkin in his book with the title *"Tribes"* has written that it is the University of Tokyo and its alumni in industry that produce most of Japan's patents and Nobel laureates[18]

This year, 2024, Japan has two of its universities among the world's top 100, and five among the top 200. It is not by accident that 156 years since Emperor Meiji woke up and established the University of Tokyo that all African roads are dominated by Japanese cars. And Japan provides so-called development aid to most African countries.

Case study number four: China

When China decided to reclaim its pioneering global pre-eminence in intellectual productivity and innovation, it focused on investing very heavily in its top 9 universities that are nowadays known as the Chinese Ivy League or C-9. Most of China's educational investment goes to 9 research-intensive universities out of over 3,000 colleges and universities. These nine universities in the Chinese C-9 ivy league are: Peking University, Tsinghua University, Fudan University, Shanghai Jiao Tong University, Nanjing University, University of

Science and Technology of China, Zhejiang University, Xi'an Jiao Tong University and Harbin Institute of Technology. These 9 universities now enable China to produce the world's largest pool of top talent in artificial intelligence, engineering, information technology, computer science, and many other fields of advanced education[19]

These Chinese C-9 ivy leagues are so well funded and protected that they are now part of an ecosystem of research and development in China that enables China to produce and register more than three times the patents produced by the USA.

In his book of the title *"The Hundred Year Marathon: China's Secret Strategy,*" Michael Pillsbury writes that the Chinese have launched a *"one-hundred-year marathon strategy"* to overcome what they see as an unfair inferiority that was imposed upon them by the West beginning with the First Opium War of 1839 when the British Royal Navy defeated the Chinese. And their main strategy is based on education and research.[19]

Case study number 5: Israel

When the Jewish people decided to rave up their fight for a Jewish homeland, they realized in advance that they must begin by establishing independent centres of excellence for producing highly talented and skilled citizens. And so, they established Technion-Israel Institute of Technology in 1912, i.e., 36 years before independence. Here is the official statement from the Technion website:

Technion – Israel Institute of Technology, consistently ranked among the world's top science and technology research universities, is Israel's first university. Since its founding in 1912, the institute has educated generations of engineers, architects, and scientists who have played a key role in laying the State of Israel's infrastructure and establishing its crucial high-tech industries. Beginning with 17 students, Technion has been Israel's primary source of technological manpower and the nation's largest comprehensive academic centre for advanced science and technology education, as well as applied research. [32]

Also, Israel established the Weizmann Institute of Science and The Hebrew University all before independence. And it should be noted that the State of Israel has continued to invest in these public universities and to keep their quality among the best on earth.

According to Dan Senor and Soul Singer, in their book of the title *"Start-up Nation,"* selection to enter the most competitive science and technology research programs at Israel's best universities is done through the Israel Defence Forces program known as *Talpiot.*[8] Each year only the top 2% of high school students numbering approximately 2000 in the whole country, are invited to compete for 200 spaces. Only the best of the best are admitted into the Talpiot program after passing a battery of intellectual capacity and physical endurance tests.[8]

Dan Senor and Saul Singer report that most of the Israeli world-class technology and security companies have been created by graduates of the ultra-selective *Talpiot Program* which admits only the best of the best each year. Israel has the world's largest *per capita* annual creation of new successful companies.[8]

Case study number 6: White South Africa

In the effort to maintain power despite being a minority of less than 10% of the total population of South Africa, White South Africans established and funded public universities of the highest global quality and for Whites only.

These universities produced top talent that pioneered human heart transplants, converted coal to oil when they could not access oil due to anti-apartheid sanctions, and created their own nuclear energy industry. These White South African universities, with the University of Cape Town and Witwatersrand at the top, remain the best universities in all of Africa. And it is the products of these universities that enabled the South African White minority to continue holding economic power even after handing over political power to Black South Africans in 1994.[33]

Case study number seven: Singapore

While all the 54 countries of Africa with our population of over 1.5 billion have zero universities among the world's top 100, Singapore with a population of only 5 million which is less than the population of Nigeria's Edo state or Sokoto state, has two universities among the top 100, and these two are the National University of Singapore and Nanyang Technological University.

It is no wonder that this tiny nation has a GDP of about 500 billion dollars while Kenya with a population that is ten times higher than Singapore has only 1/5th the GDP of Singapore.[31]

Case study number eight: Australia

Australia with a population of only 26 million which is half of Kenya's population, and one-eighth of Nigeria's population, gives so-called development aid to Kenya, Nigeria, and several other African countries. This is because Australia has 6 universities that are heavily funded and protected and routinely ranked among the world's top 100.

Australia is the home of many industrial conglomerates including the mining giants BHP Billiton, Rio Tinto, and Fortescue Metals Group which play a major role in African mining.

Case study number nine: USA

The competitive advantage of the United States of America is knowledge and innovation. It is the creator of the internet and of artificial intelligence which nowadays dominate all our businesses and our lives worldwide.

The United States of America has the world's best universities. In this year's 2024 rankings, all the top 10 best universities in the world were American, except for two from the UK.

The 80/20 two-sided educational strategy that has put America at the top of the world, was simply borrowed from the UK over 300 years ago when America established Harvard University which is modelled on Oxford and Cambridge of the UK. The United States of America has over 3,000 universities and colleges, but it places a special strategic emphasis and investment on its top 30 highly selective **research-intensive** universities out of over 3,000.

There are two major outcomes of this brilliant American strategy:

One, although the USA has less than 5% of the world's population it has almost 50% of its top 100 universities and over 25% of world GDP.

Two, the world's top 7 most valuable companies today are all American, and these are Microsoft, Apple, Nvidia, Google, Amazon, Facebook, and Berkshire Hathaway.

Countries that have developed rapidly over the last 60 years such as India, Singapore, South Korea, Taiwan, China, and Israel, have done so by simply emulating the two-sided 80/20 strategy of the United States of America and the UK.

The United States of America, of course, provides the very best example of the role of great world-class universities in the creation of **knowledge-and-innovation clusters** that drive ideas, research, inventions, innovations and technologies that lead to the growth and development of a country. It has many such knowledge-and-innovation clusters. The best known of them is Silicon Valley which has its intellectual centre at Stanford University and is surrounded by the world-class University of California system.

It should also be noted that all American states have **special schools and special honours programs** for the separate education of their most gifted and most talented citizens. These include special public charter schools and special STEM schools for science, technology, engineering, and mathematics.

Even American public universities, such as Rutgers University, have special **honours colleges within the university** for the education of the most gifted and most talented students.

And in thinking about American success, let us not forget that although the USA preaches the gospel of pure free markets, it does not practice it. The USA government is currently pouring billions of dollars of **subsidies** into its semiconductors and automobile industries. They protect and subsidize their most strategic industries. We must emulate this practice.

Case study number ten: Great Britain (the UK)

The UK has sustained the quality of Oxford and Cambridge as global gold standards for over 800 years. The UK's 80/20 two-sided strategy selects 24 of its universities out of over 160 universities and places over two-thirds of university funding in this select group of universities that are known as the Russell group. Most of the UK's research and innovation comes from the **Russell group of 24 universities**.

Africans should note that although the UK has over 3,000 secondary schools, it places special attention to only 163 government-funded grammar schools for the education of its most gifted and most talented children. The UK established its highly selective grammar schools 500 years ago and continues to sustain them.

English, the language of the UK, has become today's global *lingua franca* because of the economic success of the British Empire, and the economic success of the English-speaking American Empire.

Painful questions for Africans

1. Why did experts from the World Bank and IMF who were educated in the world's most selective elite universities force Africa to stop investing in its best public universities in the 1990s as part of the so-called SAPs or structural adjustment programs?
2. Why did The World Bank and IMF experts want Africa not to have world-class schools and world-class research-intensive universities?
3. Why is the university of Ibadan not ranked even among the world's top 500 universities?
4. Why is the university of Nairobi collapsing from lack of funding?
5. Why is Makerere University unable to compete with the best in the world?
6. Why has Kenya stopped sustaining the high selectivity and high quality of its original 18 public national secondary schools while the UK continues to sustain its grammar schools for over 500 years?
7. Why is it democratic for other countries to establish, endow and sustain highly selective world-class elite public institutions for the education of their most gifted and most talented citizens, while Africans are led to believe that sustaining elite public institutions is not democratic?
8. In economic development**,** why is it okay for the USA, and the UK and China and South Korea and Israel and other developed countries to protect and subsidize their most economically strategic industries, while African countries are led to believe that protection and subsidies are wrong?
9. Why have we swallowed these lies?
10. Why have we killed off the option of educating our most gifted and most talented children here at home in Africa?
11. Why do we continue to sleep soundly while the fires rage outside our compound threatening to consume us?
12. Why do we put classroom teachers who do not understand mathematics in charge of providing a foundation for mathematics or STEM in lower primary schools across Africa?
13. Why do we choose to maintain inferior institutions and risk becoming inferior people?
14. Why do we risk re-colonization?
15. Why do we have so many important minerals, and oil, and gas and yet be unable to mine and refine our own minerals?
16. Why do we have universities that issue PhD degrees in civil engineering, and yet continue to beg China and India and America to build our roads?
17. Why do we manufacture so little?

How can our countries be so rich in natural resources, and yet remain desperately poor?

Conclusion

If we care for Africa's future:
If we care for our grandchildren,
If we care for our dignity as human beings,
If we want to avoid being re-enslaved and re-colonized,
We should ensure that every region or town or kingdom or local government area or county or district establishes, endows and sustains at least **ONE highly selective world-class secondary school as a centre of excellence** for the FREE education of the less than 20% of the population of our children that is most gifted and most talented.
And
Each of the 54 African countries should establish, endow and sustain **at least ONE highly selective world-class university as a centre of excellence** that will be the primary source and catalyst for effective leadership, knowledge-and-innovation clusters, technology, growth and development**.**

Acknowledgement

I acknowledge the Goodluck Jonathan Foundation for the honour of inviting me to give the keynote address at the 2024 GJF annual democracy dialogues on 13th June 2024. This paper is derived directly from my keynote address.

Conflict of Interest

None

Funding

None.

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