Committee: Special Conference on Technological Advances and their Impact

Topic: The investment in science and new technologies in developing countries

Student Officer: Danai Xyla

Position: Deputy President



PERSONAL INTRODUCTION

Dear Delegates,

My name is Danai Xyla and I will be serving as the Deputy-President of the Special Conference on Technological Advances and their Impact during the 6th Campion School Model United Nations Conference. I am glad to be given the opportunity to participate in this conference, as it is a great opportunity for all of us to get ahead of ourselves.

This year, the Special Conference addresses a very interesting topic, the investment in science and new technologies in developing countries, a topic that is both intriguing and quite relevant in this day and age. Through investigating it, you will be able to understand why developing countries sometimes have higher obligations in regard to advancing technologies, but also comprehend why some of them are left behind. It is a very creative topic considering the numerous solutions that can be approached, and it initiates a logical debate that I'm very much looking forward to.

With that being said, I would like to remind you that this guide should not be your sole source of research. Both topics that the Special Conference committee accommodates need thorough investigation, as this is the key to creating strong foundations that can facilitate an interesting debate. If you face any difficulties regarding your research, or if you have any questions, do not hesitate to email me, at <u>danae.xyla@icloud.com</u> and I would be glad to help.

I wish you all a productive preparation, and I am looking forward to meeting you at the conference.

Kind regards,

Danai Xyla

INTRODUCTION

A society usually progresses when scientific advancements and innovative ideas are implemented, as they are the means that can pave the road to development. The reason why technological advancements and thorough investment in the scientific field play a major role in the development of a country, is that through advancement in the particular field, the country earns a place in the worldwide scientific scene that can endorse economic development even more. However, it is known that most developing countries, bypass scientific development stages, as they tend to focus more on restoring and strengthening their governmental state apparatus, like Equador, Guatemala and Indonesia.

Many developing countries ,such as China, focus on introducing new technologies but fall into the trap of unreasonable distribution across the mainland, leaving a significant amount of areas

impoverished, which ultimately leads to greater problems like food shortages and water in the impoverished areas, and makes advancement even more difficult. Of course, development comes in all types and sizes. A country can invest on different scientific fields to develop, like medicine that is particularly favoured India, in



National Museum of Science in China

mechanics and IT. It is specifically hard for a developing country to focus on every field equally, because developing countries gravitate more towards establishing a strong economic foundation that can bear further advancements in the years to come.

Advanced technological means also safeguard a nation's place in the world trade market. Globalisation plays an important role in advancements. The exchange of trends, scientific knowledge and cultural aspects can make the development of new technologies a challenge for developing countries, due to the increased competition from bigger stakeholders that uphold a key place in the market frontlines. As much as it is a challenge, it also pose as an opportunity for innovative ideas to bloom in the science field and lead the developing nation to a prosperous economic state.

DEFINITION OF KEY TERMS

Developing Countries¹

¹ "How Developing Countries Are Classified For Investors". *The Balance*, 2019, <u>https://www.thebalance.com/what-is-a-developing-country-1978982</u>.

Countries that are neither developed nor least economically developed and are going through a phase of transitional economy due to the rapid increase of GDP in a particular point in time

Digital Age²

Otherwise known as Information Age, or Computer Age, it is estimated to have begun between 1950 and 1970, right after the Industrial Revolution, where the rapid manufacture of electronic goods, software products and IT services that have completely adapted into our everyday lives.

Science governance³

The effect of science being so deeply embedded into our lives, that in some cases they might affect the evolution of society and governmental constitutions, and therefore question the ethical nature of democracy

Science, Technology and Innovation Policy Development (STI)⁴

The breakdown of poverty eradication strategies that are used to assist Sustainable Development Goals in developing countries. They are consisted of these tree frameworks that reform and upgrade STI policies in nations that are going through a transitional economic phase.

Technological Leapfrogging⁵

The phenomenon of a nation skipping a stage of technological development and move directly to adopting the most advanced technologies without having "completed" intermediary steps

TIMELINE

Date	Description of the event.
1991	UNESCO is working with developed countries on scientific developments

² "What is Digital Age." *IGI Global: International Publisher of Information Science and Technology Research*, <u>www.igi-global.com/dictionary/digital-age/7562</u>.

³"Governance of Science | Encyclopedia.com." *Encyclopedia.com | Free Online Encyclopedia.* <u>https://www.encyclopedia.com/science/encyclopedias-almanacs-transcripts-and-maps/governance-science</u>.

⁴ "STI Policy Development | United Nations Educational, Scientific and Cultural Organization." UNESCO | Building Peace in the Minds of Men and Women,

www.unesco.org/new/en/natural-sciences/science-technology/sti-systems-and-governance/sti-policy-develop ment/.

⁵ "Leapfrogging." *Leapfrog Desarrollo De Estrategias Digitales Y Software | Leapfrog,*. <u>https://leapfrog.cl/en/leapfrogging</u>

1993	The Scientific Technology and Society (STS) Programme is terminated
1999	Finland evaluates every single State Research Institute in the country to make sure they all achieve scientific excellence
2002	The Division of Science Analysis and Policies enters the International community
2008	A worldwide economic crisis begins following the bankruptcy of the Lehman Brothers, causing a variety of firm shut downs, and freezing the world economy.
2009	A decline of 4.5% in business expenditures on research and development, which impacts innovation globally
2010	Partial recovery from the economic crisis in Europe
2011	Implementation of STI policies in Africa
2016	Xi Jinping, Chinese premier, announced at the National Conference on Science and Technology a three-step road map that will lead China to conduct innovation-driven development.
2017	The EU begins promotional campaigns of soft power through science

BACKGROUND INFORMATION

Innovations always existed throughout centuries, whether that was fire, pottery, railways or computers. The huge innovative breakthrough that gave a head start to the revolutionary era of technology, that we are lucky enough to experience today, was the Industrial Revolution of the 18th century. During that era, Britain, followed by other European countries and the United States, started producing large amounts of innovative products like the toaster, that only increased the need of better and faster production and development of new processes. The Industrial Revolution reached its peak in the United States in the 1920s, where greed and consumeristic tendencies of the American public grew so much, it led to the Wall Street crash.

Of course, not all countries managed to keep up with the fast pacing technologies, due to internal or external problems they were facing, most of them being classified as LEDCs as per now. Needless to mention, surpassing the industrialization stage is not the only cause of this drawback. The longer unindustrialized countries remained stationary, the bigger the gap between them and the developed ones, and that makes it even harder for them to catch up today, and being left behind led

to increased poverty because of the available funds of the country being distributed elsewhere and the taxation system to cover debt is too high. Thus, the classification of countries to developed and developing, which makes it easier for people to understand which countries are in a phase of transitional economies and which are already able to develop without compromising the economic equilibrium of the country on a greater scale.

UNESCO's STI Policies⁶

UNESCO developed a plan called STI, in order to help every country develop scientifically. UNESCO started focusing on science policies and organisation somewhere between 1965 and 1991. In early 1990, they established a separate unit that dealt with science policy studies and the many Member States requested to join. Between 1988 and 1993, the STP (Science and Technology Program) evolved to the STS (Science Technology and Society) which had three main goals:a) to promote scientific culture by opening museums and employing science journalists, b) to assist the management of implemented policies and c) providing advice for regional training. Lastly, the program for Ethics of Science and Technology was implemented to UNESCO's Sector for Social and Human Sciences.

United Nations Educational Scientific and Cultural Organisation helps its member states to establish their unique STI policies, schemes and plans and go the extra mile to reform their science systems through evaluating their policy options that address science governance of a nation. What UNESCO did id that it provided guidelines and methodologies along with monitoring implementation systems in regards to STI activities. This project started in 2004, and since then UNESCO had made significant progress in reforming the science systems in Nigeria and Congo, accompanying Tanzania as well since 2008, a country that is one of the 8 pilot countries that improved the most since the reforms were implemented. In October 2007, the African STI Policy Initiative was launched in an attempt to build capacity in "evidence-based policy-making". The expected result of ASTIPI was firstly the capacity for policy analysis in Africa to be increased with more than 100 specialists involved, within the timeframe of 2008 to 2011. They also aimed for the implementation of short-term executive workshops for government specialists, and the creation of an electronic library for STIs so that everyone can have access to it.

GO-SPIN[']

⁶ "A Brief History of UNESCO's Science Policy Programme | United Nations Educational, Scientific and Cultural Organization." *UNESCO* | *Building Peace in the Minds of Men and Women*, www.unesco.org/new/en/natural-sciences/science-technology/sti-policy/a-brief-history-of-unescos-science-p

olicy-programme/.

⁷"Training and Resources." *UNESCO*, 6 Dec. 2016, en.unesco.org/go-spin/training-resources. <u>https://en.unesco.org/go-spin/training-resources</u>

Within this framework, UNESCO establishes developing facilities such as the Global Observatory of Science, Technology and Innovation Policy Instruments in December of 2018. Because of the major importance of STIs for social, economic and sustainable development, the monitoring of the implementation was urgent. GO-SPIN is used to make evidence-based decision making more sufficient and design STI policies, review them and evaluate them. An organ has access to valuable information on those policies and their instruments and identifies gaps in their implementation, as well as initiating comparisons with STI Policies that other countries follow.

The strategy of the GO-SPIN is four-fold. It revolves around capacity building, standard setters,

data collection, and the GO-SPIN platform. The Capacity building strategies focus on training STI governors in design, implementation, and evaluation of the STI policy instruments. The training workshops began in 2012 in Africa and more were held in Senegal, Rwanda, Guatemala, Mozambique, and Burundi. The standard setters combine practices for surveys on STI Policies and practice for policy instrument governance, according to the Paris Manual, which is the main



The six dimensions of the programme

standard-setting instrument. The data collection part simply refers to the distribution of GO-SPIN surveys to the worldwide, and the GO-SPIN platform is an online, all access platform for decision-making, exchange of ideas between specialists and the public and upholds a completed set of different information on STI policies.

Mid-term Review

The establishment of the MTR is specifically targeted at LEDCs and at developing countries. It is a type of evaluation that is conducted for an ongoing project, and it primarily has two purposes, being decision-making and accounting for stock of initial lessons from experience. It is a type of plan that aims at identifying strategies that can provide solutions to very specific problems and it is used to reinforce already existing initiatives in an attempt to demonstrate potential success. It can be referred to as a capacity development project that is targeting the establishment of the skills of individuals and scientific institutions

⁸ "Chapter 25." 404 / UNDP, web.undp.org/evaluation/documents/mec25.htm. http://web.undp.org/evaluation/documents/mec25.htm

Scientific advancements have shaped the world we feel free to enjoy today. The storyline of how humanity went from discovering fire and building railways to custom cancer vaccines is an interesting and ongoing one. Unfortunately, not everyone can have access to the things we take for granted, and this further adds up to the discriminatory nature of humans and their need to create further problems. Engaging with science in countries that can't financially cope or they are unable to do so due to the lack of resources, has been a rally for the smoother co-operation of the global community, but through development of programs, frameworks and legislative bodies like UNESCO, those changes can come even to countries that have their industrial development to an infancy level. Due to the fact that developing countries base their economy on agriculture, there is a high possibility that through technological innovations taking over the market, people that soelly base their income on agriculture might lose their jobs or be forced to "industrialize" along with the rest of the country.

MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

United Nations Educational Scientific and Cultural Organization

UNESCO, through their STI policies, have achieved to create a framework of development that not only it enhances advancement, but also eradicates poverty. For the past 2 decades, UNESCO has implemented their STI policies in Africa, Arab States, Asia and the Pacific, Europe, North America and Latin America, and has already achieved to complete their goals assigned in the 2030 Agenda for sustainable development. Recently, UNESCO set up the STI Policy Blueprint, that assess the changes in the technological developments of states that have adopted STI, aiming for a more effective policy implementations and management.

World Bank¹⁰

The World Bank plays a very important role in science technology in developing countries, through their "Science and Environment Education Views" a framework that targets education in developing countries, dating back to 1999. The demands to be met, set by the World Bank, is to provide education for almost every student, to restore low quality education in primary grades and to ensure lifelong learning. They also attempted to restore the teaching system, encouraging teachers to avoid posing as an authority figure, but to facilitate a self-directed learning. They also

⁹"STI Policy Development | United Nations Educational, Scientific and Cultural Organization." UNESCO | Building Peace in the Minds of Men and Women,

www.unesco.org/new/en/natural-sciences/science-technology/sti-systems-and-governance/sti-policy-develop ment/.

¹⁰Documents & Reports - All Documents | The World Bank,

http://documents.worldbank.org/curated/en/883301468775751700/pdf/multi-page.pdf

encouraged the installation of science labs in schools, for the students to let down possible science misconceptions and keep in touch with natural phenomena.

Swedish International Cooperation Agency (SIDA)¹¹

SIDA is a government agency operating in Sweden that aims at economic growth, equality, democratic development, environmental protection and many more. In regards to scientific development, SIDA has extended their support to the IFS, International Foundation for Science, in order for them to build scientific infrastructures in developing countries and LEDCs to boost career capabilities of young researches.

China¹²

China is considered to be the future of innovation. As a developing country itself, China managed to increase their GDP to a percentage of 6.9% per capita by the end of 2017. China is being introduced to rapid growth in regards to technological and industrial growth, but also high regional disparities that shift China away from sustainability. China's economy has rose to be the world's second largest, and their technological sector is reaching a critical level of expertise.

Albania¹³

Albania is listed to be one of the developing countries as in 2018 according to the IMF. The GDP expenditure for scientific research and development however, does not exceed 0.18% and this led Albania to the last place in the European rank list. UNESCO employed their STI Policies in Albania in 2009 to 2015. The STI Policies focused on tripling the public spending on R&D to 0.6% and develop at least 5 Albanian research centres that have the potential to excel, and therefore increase the number of researchers.

Korea¹⁴

Korea ranks 9th in the worldwide list of GDP expenditure on research and development, having invested more than 4% of the GDP. The Republic of Korea began investing on science in 1959, when they founded the Korean Atomic Energy Commission. A very important milestone in Korea's history on development is the founding of Samsung, where by the end of 1986, the total sales

¹¹"IFS - Sida Renews Its Strong Financial Commitment to IFS." *IFS - International Foundation for Science - Home*, 18 June 2014, <u>www.ifs.se/ifs-news/sida-renews-its-strong-financial-commitment-to-ifs.html</u>.

¹² "Technological Changes and Regional Development in China." *United Nations University*, <u>http://unu.edu/projects/technological-changes-and-regional-development-in-china.html#outline</u>.

¹³ LLC, Revolvy, ""Science and Technology in Albania" on Revolvy.com." *Trending Topics | Revolvy*, www.revolvy.com/page/Science-and-technology-in-Albania.

¹⁴ "South Korea - The Role of Science and Technology." *Country Data*, www.country-data.com/cgi-bin/query/r-12337.html.

reached the incredible amount of 14.6 billion won, due to the shift from labour-intensive industries to automation. Soft industries developed in the same pace, increasing the demand for skilled workers, making it difficult for those unqualified to find a job

Azerbaijan¹⁵

Azerbaijan in listed as a developing country, with their economy growing by 24% the last 7 years. UNESCO sent a mission to Baku in 2009 in order to implement the aforementioned STI Policies, in order to assist the Azerbaijan National Academy of Sciences and their attempt to design a plan for formulating new policies that target capacity buildings.

UN INVOLVEMENT

<u>Resolution 66/288 in 2012</u>¹⁶: Tries to combine all levels of government and legislative bodies, as well as private businesses in promoting sustainability, closing the technological gap between developing and developing countries, and therefore endorse a science-policy interface. The most important part of the resolution is the need for a democratic state in order for development to flourish, and that development should be people-oriented, including youth and young children as well. The last important remark of this resolution is the role of civil society, where it is important that everyone is able to access education as a means to ensuring civil society capacity.

<u>Resolution 68/220 in 2014</u>¹⁷: The resolution discussed the promotion of a facilitation mechanism in order to strengthen the development and transportation of environmentally sound technologies to LEDCs. It also praises the cooperation between UNCTAD and the Commission on Science and Technology for Development as they succeeded in creating a database of all centres of excellence in developing countries in order to endorse the exchange of ideas concerning medicine, technology, designing and mechanics.

<u>Resolution 69/214 in 2015</u>¹⁸: Resolution that urged the implementation of the Rio Declaration and the Johannesburg Declaration, two very important summits. Apart from that, it focuses on eradicating poverty as it stresses that this is the main thing that is holding development back. Lastly, it supports green development, meaning that it suggests designated frameworks that promote

www.unesco.org/new/en/natural-sciences/science-technology/sti-policy/country-studies/azerbaijan/.

¹⁵ "Azerbaijan | United Nations Educational, Scientific and Cultural Organization." UNESCO | Building Peace in the Minds of Men and Women,

¹⁶ Welcome to the United Nations, www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_66_2 88.pdf.

¹⁷ UNCTAD | Home, <u>https://unctad.org/en/PublicationsLibrary/ares68d220_en.pdf</u>

¹⁸ "A/RES/69/214 - E - A/RES/69/214." *ESubscription to United Nations Documents,* <u>https://undocs.org/A/RES/69/214</u>

development that has minimum impact on the environment and calls for an ad-interim arrangement in all developing countries.

POSSIBLE SOLUTIONS

Customised policies¹⁹

Through customised policies that are to be decided between the developing country and UNESCO, the country could establish a framework, different from any other, which would fulfil their needs and satisfy them. These policies can make changes to a country's budget distribution in regards to which scientific field is the most underdeveloped. The new policies should work in accordance with innovation indicators that will monitor the performance of each field, like the ones provided by OECD. The indicators will focus on Science and Technology, innovation surveys and composite indexes that combine different indicators together. The data collection will be customized to fit the different socio-economic context of each country, as an attempt to build competence within the statistical framework and the new policies. The important part is for those new policies is to clarify the actual and perceived needs, as not every solution will be applicable if the real problems cannot be targeted.

Volunteering specialists²⁰

Volunteering specialists can be send to developing countries to help in any way possible in regards to innovation. Volunteering projects can sent engineers, scientists and economists to teach, assist with infrastructure and help with budget distribution. Engineers can widely help with infrastructure, creating incubators, hubs and new challenges that all can have access to capital. These programs will further endorse the sharing of resources and the careful distribution of budget, and give entrepreneurs a chance to fund and assist their market interests, since the main problem developing countries face is the lack of investment capital.

Promoting of sciences in schools²¹

¹⁹ lizuka, Michiko & Hollanders, Hugo. "The Need to Customise Innovation Indicators in Developing Countries." *Economics and Finance Research | IDEAS/RePEc*, 2 Feb. 2017, <u>http://ideas.repec.org/p/unm/unumer/2017032.html</u>.

 ²⁰ "How Can We Improve Innovation in Developing Countries?" *LinkedIn*,
<u>www.linkedin.com/pulse/how-can-we-improve-innovation-developing-countries-marissa-fayer</u>.
²¹ "THE DEVELOPMENT OF SCIENCE EDUCATION IN DEVELOPING COUNTRIES / GEL?'MEKTE OLAN ÜLKELERDE

FEN B'L'MLER? E?'T'M'N'N GEL??'M?" Academia.edu - Share Research, www.academia.edu/1098501/THE_DEVELOPMENT_OF_SCIENCE_EDUCATION_IN_DEVELOPING_COUNTRIES_ GEL%C4%B0%C5%9EMEKTE_OLAN_%C3%9CLKELERDE_FEN_B%C4%B0L%C4%B0MLER%C4%B0_E%C4%9E%C4 %B0T%C4%B0M%C4%B0N%C4%B0N_GEL%C4%B0%C5%9E%C4%B0M%C4%B0.



Online, FE. "Make Home Science Mandatory for Boys in School: Government proposal." The Financial Express,

Promoting education is a long-term solution that can help with the upbringing of future scientists and not only, as it also poses as an essential vehicle for human resource management and development, modernisation and growth. Sciences education acquaints children with technology from a very young age, resulting to the development of their practical skills and intellectual knowledge. Of course, science

education needs financial support that the country might not be able to provide, and thus the poorly equipped labs that do not boost scientific inquiry. In developing countries, the establishment of democratic institutions will improve admission rates regardless of gender, background and financial status, and achieve a student-oriented learning. It is very important to understand that even though the individualism of the students will endorse innovation, teachers play a significant role in assisting and not leading the procedure. Co-operation of teachers and students should be supported, as it will make the exchange of ideas and achievements of new technologies more productive.

Strengthening basic and generic information science and technology²²

In order to be on the frontiers of the global information science and technology scene, the ability to generate the seeds of innovative science and technology must be cultivated, through strengthening basic information science and technology can lead to a long-term solution. The types of basic information science and technology that need to be taken under consideration by those with the potential to deliver new perspectives in information science and technology, are first of all innovative hardware such as components with new features, innovative software that can be advanced to a level that it allows it to employ new concepts or techniques to in order to bring unrealizable features to the market, and revolutionary information processing techniques based on human intelligent functions as cognition. it is important to make sure that results can be accessible and understood to society and this requires a new level of cooperation with institutions and the private sector that will turn the results into research proposals.

²² "Measures for the Strategic Promotion of Information Science and Technology Pioneering the Future." 文部 科学省ホームページ, <u>www.mext.go.jp/b_menu/shingi/kagaku/shimon25/shi25e.htm</u>.

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