Forum:	General Assembly Third Committee
Issue:	Implementing a K-12 educational framework to equip students for life in the Fourth Industrial Revolution
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Introduction

As our world moves further and further into a different era of advancements, there are many benefits and detriments to the Fourth Industrial Revolution that we must all consider preparing for. Shifting from the Third Industrial Revolution to the Fourth is in no way simple. As the world changes from using technology as a tool to fully emerging inside it and creating cyber-physical-biological systems, implementing a K-12 educational framework to equip students for life in the Fourth Industrial Revolution becomes a priority issue and a topic of urgent discussion for the best possible solutions to the problem.

This report explores the benefits and disadvantages to the Fourth Industrial Revolution – for example, it brings with it life-saving creations, however it removes thousands of manual labour jobs. The report also brings up historical context and timelines to get a better understanding of the past and how it will predict the future.

Definition of Key Terms

The Fourth Industrial Revolution

The term first coined by World Economic Forum founder Professor Klaus Schwab, the Fourth Industrial Revolution is said to have started officially in 2016. The Revolution can be defined by integrating physical, technological and biological systems together to form world-changing creations.

Cyber-Physical Systems (CPS)

Cyber-physical systems can be defined as systems of collaborating computational entities which are in intensive connection with the surrounding physical world and its on-going processes, providing and using data-accessing and processing services on the Internet.

History

Industrial revolutions throughout history

The First Industrial Revolution

Beginning in 1784, the First Industrial Revolution is considered a turning point in human history as it marked the inventions of steam, water and mechanical production equipment.

The Second Industrial Revolution

From 1870, the Second Industrial Revolution involved the creations of electricity, mass production and a system to divide the labour force.

The Third Industrial Revolution

In 1969, the Third Industrial Revolution started, bringing along with it inventions in the electronics, IT and automated production departments. The Third Industrial Revolution is what led into the current Revolution, which means that these departments will also be major factors in the Fourth Industrial Revolution.

The growing technological industry

Already, as of 2022, many creations that fit under the category of cyber-physical/biological systems have come into existence. To name just a few, the genetic toggle switch powered by transient environmental signals, or the ‘Repressilator’, a genetic circuit that can exhibit oscillations of the expression of a reporter gene. Or, in terms of cyber-physical systems, implantable medical devices, or planes that can automatically fly in a controlled airspace.

The impact of the beginning stages of the Fourth Industrial Revolution

Although few recognize it, the impacts of Fourth Industrial Revolution stage creations have changed our world. Scientists are currently researching synthetic biology as a way to potentially cure cancer. AI has taken over thousands of manual labour jobs in the world’s

industries. Certainly, as we progress further into the revolution, we'll feel more changes, and more drastically, both the good and the bad.

Key Issues

Disruptive impacts on education

In today's status quo, students are being taught in a direct way with a defined educational framework, that of which will rarely change. This current system will simply not work as the Fourth Industrial Revolution begins.

As the world moves further and further into the beginning stages of the Fourth Industrial Revolution, the fast speed at which the revolution develops, as well as the magnitude of the impact that comes from each development, will alter everything about the future. Therefore, a key issue in this topic is what should be emplaced in a K-12 educational system in order to cope with the disruptive impacts that the Fourth Industrial Revolution may bring on education.

For example, in 2022, virtual agents were created, these of which have become valuable tools in society already. Virtual agents are computer applications or artificial intelligence systems that can interact with humans, for example chatbots, or products like Google Assistant. The impacts virtual agents make, especially in the future, are detrimental towards people's careers, as well as the use of a human being's expertise in a certain subject. Therefore, a system (such as in today's status quo), where a student is still practicing handwriting, or spelling, is less effective, as the jobs that involve these aspects will most likely be taken over by AI.

Different creations, as well as the fluctuation of the tech industry market, will greatly impact the future. So this means that an educational framework in order to prepare for the future must also fluctuate in correlation to the other factors affecting the world in that moment.

Lack of soft skills needed in order to prepare students

The Fourth Industrial Revolution, while incredibly necessary to move our world forward, will also be the main factor of serious largespread issues such as unemployment, which on a second level, will lead into problems, like poverty and a lower quality of life, to be brought into light. The current education system today will not be able to prevent the next generations from falling into this hole of poorer lifestyle.

By 2030, AI is predicted to eliminate 73 million US jobs, this of which would equate to a devastating 46% of current jobs lost. We should also take in account that in 2030, we will still be at the very start of the Revolution. This statistic alone should prove how drastically AI will change our lives, most especially our career force.

In the status quo, the focus of education is in the wrong direction of what it should be during the Fourth Industrial Revolution. Education today relies on teaching students hard skills such as mathematics, writing or science. These skills would not be able to prepare the students for their adult life in the Revolution.

Lack of education on how to be a global citizen

Although the current Revolution relies on not only technological aspects, but also physical and biological systems, technology is ultimately the foundation that connects all three of these fields. The digital world is getting bigger and bigger, but most importantly, more accessible for people all over the world.

Most education systems emplaced in the world today do not consider a framework that will allow students to develop into open-minded and global citizens. The lack of education on this means that with the current Fourth Industrial Revolution, students cannot learn how to be empathic and accepting of different cultures and people, all through digital connection platforms.

Major Parties Involved

Japan

Japan was one of the first countries to understand and accept the true power of technology, then acting on it by embracing its benefits. The country started investing in the tech industry at a very early time compared to other countries, which is why it's now one of the most powerful tech giants in the world.

In the country as of now, courses in computer science and programming are being offered as mandatory in educational frameworks. This is clearly to prepare the younger generations for the Fourth Industrial Revolution, as the whole foundation of the revolution is based on technology and creations that help the world by intertwining technological, physical and biological systems.

China

In the late 1900s, the Chinese government launched ‘863 Plan’ and the ‘Strategy for Rejuvenating the Country through Science and Education’ successfully. The ‘863 Plan’ concentrated on developing technologies in agricultural and pharmaceutical fields, while the other program focused on strengthening the country’s technological departments in education systems. Both of these programs promoted technological productivity and growth in the tech industry, which are reasons why China is such an influential country in the technological world today.

The programs were overall successes as China increased educational resources as well as invested in teaching computer science and programming significantly.

Because all these reasons contributed greatly to the rise of the Chinese tech industry, China is now predicted to become the World’s Technology Leader throughout the 21st century.

Timeline of Relevant Resolutions, Treaties and Events

Date	Description of Event
1784	The First Industrial Revolution is considered a turning point in human history as it marked the inventions of steam, water and mechanical production equipment.
1870	The Second Industrial Revolution involved the creations of electricity, mass production and a system to divide the labour force.
1969	The Third Industrial Revolution starts, bringing along with it inventions in the electronics, IT and automated production departments. The Third Industrial Revolution is what lead into the current Revolution, which means that these departments will also be major factors in the Fourth Industrial Revolution.
1981	The first 3D printer is invented. 3D printing is predicted to be depended on extensively during the Fourth Industrial Revolution for the invention of cyber-physical-biological systems.
2016	5G Network is invented, a system where all 5G wireless devices can be connected to the Internet and telephone network through radio waves. These new networks have a higher download speed, up to 10 gigabits per second. The 5G network (and beyond) are going to be essential in the Fourth Industrial Revolution as the technological industry grows.

2016	The concept of the Fourth Industrial Revolution is coined by Professor Klaus Schwab, who is the founder of the World Economic Forum.

Previous Attempts to Solve the Issue

The Kakuma Project, Kenya

An example of an attempt to solve the issue is in Kenya, through the Kakuma Project. The Kakuma Project includes creating The Innovation Lab Schools, which have developed their own curriculum that combines the 17 UN Sustainable Development Goals with STEAM. Their goal is to learn how to foster empathy and global citizenship.

AWARE, Indonesia

The Accelerated Work Achievement and Readiness for Employment, or AWARE, has the goal to build a workforce with the skills needed to succeed in the digital economy. The project is unique in the way that it creates direct links between students and industry leaders to fully support the youth to be better prepared for the Fourth Industrial Revolution, by teaching them skills to do with possible future careers.

iEARN, Spain

The International Education and Resource Network, or iEARN creates a global community of learners that can be included in cross-cultural exchange and collaboration through a virtual platform. Through the project, students can work with peers from all over the world, aiming to inspire positive change for their community and the world.

Possible Solutions

Altering the 'goal of education'

In the status quo, the 'goal of education' in most education systems is completely thought of in the wrong direction. Students are taught how to read, or how to add

numbers…etc., however the truth is these skills are not the most urgent nor valuable in the Fourth Industrial Revolution.

In his book, *Future Shock,* Alvin Toffler wrote: “The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.”

Toffler in this case says this exactly right. The goal of education as of now needs to be altered to fit the trends and fluctuations of different creations as well as the tech industry market. Education frameworks should stop teaching students the skill of doing something, and change their mindset to do anything. What this means is that schools should teach students how to learn continually throughout their whole lifetime, this ensuring that their knowledge and skills stay relevant to what’s happening in the world. This should be included in the new K-12 educational framework.

Learning skills to help other human beings

As our reliance on AI grows and grows, the career force will be impacted devastatingly. In the new educational framework, schools should promote gaining skills such as entrepreneurship and leadership. This is to ensure that in the future these students can provide new jobs for those who are unemployed or have an overall unsatisfactory quality of life, thus contributing to creating social stability.

Learning skills that are unique to human beings

Although the increase of AI means that a lot of jobs will be replaced by machines, especially in the labour force, many other careers that are simply unachievable with AI have skills that should be what the new educational framework promotes in their students. This means that encouraging skills like critical thinking, problem-solving, social skills and leadership in the classroom is a good solution that should be discussed when talking about this issue.

The benefits to emplacing this in the framework is that it will teach students to not compete with machines, but instead be partners to make the world a better place.

Promoting global citizens

In the status quo, schools want to make their students learn math, English, science…etc., but in the Fourth Industrial Revolution ensures that there are more important skills to be learnt. In a digital, much more interconnected world, students of the future will need to have a global mindset. The educational K-12 framework must take this into account. For example, subjects like history should not be only taught from the perspective of a single country, but instead from points of views of people, groups and countries all over the world.

The global mindset and global citizen model is one that we should enforce into educational frameworks all over the world, so that students in the future can communicate, collaborate and share diverse voices all over the world.

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