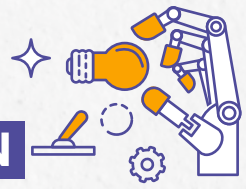
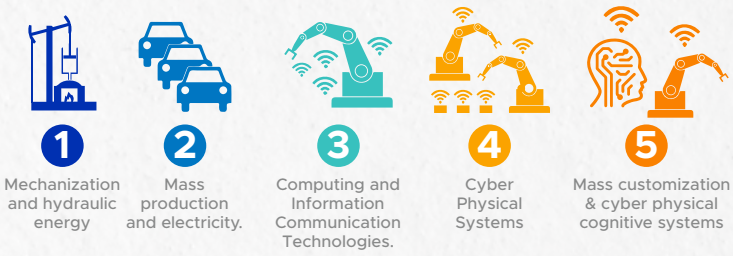
INDUSTRIAL REVOLUTIONS AND EDUCATION



Science has made possible to create advances by changing the way we live, produce, communicate and relate to each other. This dynamic nature of science has brought great transformations with it . Thus, strong waves of changes have been generated in industries through the adaptation of a set of new techniques, which have come to be known as industrial revolutions.

To understand the context of this type of transformation and to know where we are, where we could go, and what is the role of education as a dynamic axis, we dedicate this issues note, which recounts these historical revolutions (Banrepcultural, 2017), its most important educational elements and impacts.

Image: Summary of the Industrial Revolutions



Source Aslanhan (2020)

1st Industrial Revolution: mechanized the textile industry.

It begins in 1786 with the creation of the steam engine, changing the industry, especially the textile and transport in England. Education was not accessible to the entire population but only to the most privileged.

Given the costs of education, many boys and girls did not know how to read or write; however, around 1833 the English government decreed two (2) hours of minimum education mandatory for boys and girls who worked in factories, likewise they began to give classes in night schools for workers. After a process that was led by The Ragged Schools Unions, initiatives and laws began to be generated that allowed the poorest boys and girls access to school (Yuko, s.f.).

2nd Industrial Revolution: high-volume industrial production and high mass consumption.

It starts in the middle of the 19th century. It was characterized by advances such as the development of electricity and its multiple uses. In this period, advances led to the creation of the automobile, opening the way for the oil industry. In terms of education, the following events took place:

1868: The Public Schools Act **improved UK schools.**

1880: School was **mandatory for children under 10 years of age.**

1902: **The "Education Act" was created,** which established the secondary schools (Yuko, s.f.)

Towards the end of this century, there was a rapid expansion of universities, however, it was characterized by attendance at a physical place (University Campus), where students received information that the teacher provided through brochures and textbooks, this being a unidirectional interaction (Beno, 2019).

3rd Industrial Revolution: development of networks and telecommunications, as well as mass transportation systems.

By 1970, the aviation and astronautics industries received a great boost, and work began on atomic energy, electronics, communications and cybernetics. In this revolution, the process of digitalization and web-based interconnectivity began to be created, as a result, Internet resources began to be a normal part of learning activities. This is where online courses and platforms began to emerge, such as MOOCs (Massive Open Online Courses), Mooodle[1] and Edmodo, which offered immediate and free or low-cost access to information (Beno 2019)

4th Industrial Revolution (4RI): artificial intelligence and digital transformation as drivers of productivity and innovation.

In 2013, the 4RI, also known as 4.0 Industry , began to be talked about, which is a mixture of production techniques with intelligent systems that integrate with organizations and people. This revolution represents a fundamental change in our way of living and working, since it merges the physical, the digital and the biological world, articulating technologies in a promising and disruptive way, forcing us to ask ourselves questions about how countries can develop, how to create value in organizations and how people can benefit from innovations, with a view to creating a more inclusive and human-centered economy.

In this revolution, the world is already open to knowledge, therefore, the need for a profound transformation in education has been significantly evidenced, which allows not only the adaptation of the industry and all spheres of society to the fourth industrial revolution, but the production of innovation, taking into account the boost of virtual education due to COVID-19. Particularly, Medellín has been identified by the World Economic Forum as a 4RI-Med Center, which implies that the city is a space for the exchange of knowledge for global cooperation

Within these strategies, Medellín has led the implementation of the ***Ciudadela de la Cuarta Revolución y la Transformación del Aprendizaje - C4TA-*** and the Virtual University Citadel of Arroba Medellín, which encourage people to acquire and update knowledge and skills to take advantage of the technologies of this revolution, with the help of new methodologies that have been modified by rapid and profound technological changes, and that promise to continue transforming education through the use of technologies such as virtual reality, artificial intelligence, blockchain, Internet of Things (IoT), among others.

Consequently, this dynamic will not stop, and what is believed to be the focus of the fifth industrial revolution can already be glimpsed, as described in the following numeral.

5th Industrial Revolution: combination of humans and machines in the workplace.

This revolution aims to promote the transformation of the industrial sector into smart spaces based on IoT and cognitive computing[2]. Unlike the fourth industrial revolution, it is intended that instead of humans competing with robots for work, as feared in the previous ones, these robots, called Cobots (collaborative robots) collaborate with the tasks that people carry out; this with the purpose of automating repetitive, manual or dangerous processes for people, giving humans the opportunity to use and develop their creative talent (Oxford Economic, 2021)

Final Thoughts:

Education will be focused on learning what you need to know for a specific moment, therefore, learning will be permanent (Goode, 2021), and all educational levels must be articulated to provide more relevant formation. Sapiencia is committed to leading the educational transformation and the positioning of the post-secondary education system, which is characterized by its relevance with the technological and social changes of the moment.

Sapiencia bets on creating an inclusive, participatory model that promotes the universalization of knowledge and education throughout life, involving their collaborators and value groups in this process.

[1] It is a free access tool for learning management.
[2] It refers to technological platforms that, broadly speaking, are based on the scientific disciplines of artificial intelligence and signal processing.

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