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1 The Fourth Industrial Revolution: Shaping a Humane World?

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Abstract

The 4th Industrial Revolution (4IR) is a new chapter in human development, enabled by technological advancements commensurate with the First, Second, and Third Industrial Revolutions. The 4IR revolves around automation and data exchange, including cyber-physical systems, the internet of things (IoT), and cloud computing. 4IR, controlled by artificial intelligence and intelligent robots, will supplant people in specific sectors. These technologies reflect the interests and desires of their creators, and these technologies shape the lives of the people. In the words of Professor Avram Noam Chomsky, society reduces education to the requirement of the market. He opined that human beings have no intrinsic, moral, and intellectual nature in educational institutions so created. The emphasis is on the workforce, mind, and machine for the marketplace. Education so imparted is one without a soul leading to weak ethical norms and dangerous trust deficits in communities. Educators must investigate new and creative approaches to educational innovation to upgrade future learning. The need is for education with a soul. Education should develop students' moral, civic, and creative capacities and prepare them for a livelihood and, more importantly, life. This chapter argues that educators must cultivate "double consciousness" to humanize technology through the bold vision of moderation and middle ground.

Keywords

Chomsky, Fourth Industrial Revolution, Higher education, Ethics and Values, Factory-like model, WEIRD, Moderation, Education with a soul.

Introduction

Higher educational institutions, at one time, were small and drew a small group of students from the upper classes. Since 1945, the number of "modern" (read, post-industrial revolution) universities expanded, and higher education became worldwide. The governments felt an essential need for more university graduates to compete in the more complex technologies. The upward expansion of the world economy after 1945 led to the mushrooming of the universities. Indeed, this changed the university and thus its original purpose. In some cases, universities then lost the quality of intimacy and collegiality among the university community members. This situation worsened when the world economy entered its long stagnation,

and the reshaping of the HEI was based on economic logic as the costs of university education rose. Yet, demand continued to expand. How have higher educational institutions coped? The universities began to transform themselves into more business-like institutions akin to an assembly line for mass production.

The situation continues to spiral with the coming of the Fourth Industrial Revolution (4IR) as a continuum from the previous Industrial Revolutions spanning more than two hundred years ago. Consequently, there began evaluations of universities regarding their output for the money invested and the return on investment. How has it impacted universities around the world? How should they respond?

Industrial Revolutions

In the last 250 years, the world experienced four Industrial Revolutions that changed the industry's face and impacted higher educational institutions. The socio-economic structure and the meaning of "work" and "labor" took a different turn leading to more exploitation and discrimination, especially among women and children. In 1780, with the invention of the Steam Engine, the First Industrial Revolution changed the workforce as the demand for manual labor dampened since machines were able to complete jobs faster and better. Steam power has been described as the hub through which the spokes of coal, iron, and cotton were linked (Rosen, 2010). Machines substituted manual labor, families moved from the rural to the urban areas, and agricultural life gave way to a life of industry. A vision for a new kind of curriculum began to form, providing more diversified degree options and new general education courses to expand the scope of learning by choosing from a variety of industry-led and machine-oriented methods. Charles Eliot (1869) described this as the New Education, a system that is not highly organized and does not create a strong bond of common association and good fellowship among the members.

From 1860 to 1900, the Second Industrial Revolution was associated with new manufacturing technologies leveraging electricity, which triggered additional changes forging a new economy (Atkeson & Kehoe, 2007). Instead of end-to-end knowledge about a product, the workers were required to play their mechanical role in the production line, with expertise in a tiny area. Steel production heralded the birth of skyscrapers, railways, and electric motors and redefined the meaning of progress and development. Society changed again, whereby material wealth took a more central stage as the way of life. Higher education expanded with the proliferation of several types of higher educational institutions. The idea of an ivory tower was introduced in France in the 1830s as *tour d'Ivoire*, meaning an impractical dreamer - conjuring an image of the eccentric scholar, disinterested in the real world and seeking only to add to a parochial branch of human knowledge. The symbol lives well into the 20th Century, whereby those involved are isolated from what is essential for the lay public.

The Third Industrial Revolution, attributed to computerization and web-based interconnectivity, developed in the 1980s and the 1990s, was an impactful force. The rigid systems of the production line suddenly became flexible, and information and communication technology spread to all industries, from agriculture to banking, administration, and shipping. Access to higher education rose drastically with increased diversity on campuses and the globalization of academic research accelerated by online technologies. The image of an ivory tower is further enhanced given the emerging technological divides.

The Fourth Industrial Revolution

The First, Second, and Third Industrial Revolutions capitalized on emerging technologies like water and steam power, electricity, electronics and automation, information technology, and internet connectivity. The Fourth Industrial Revolution (4IR) builds on the Third and is characterized by technology integration and blurs the physical and virtual (digital) lines. Biological fields are collectively referred to as cyber-physical systems. It is said that humankind has never experienced this multi-technological transformation's scale, scope, and complexity.

The term industrial revolution was first coined by a group of scientists working on a high-tech strategy for the government of Germany. It came to be referred to as Industry 4.0 in 2011 when the project *Industrie* 4.0 was launched at the Hannover Fair.

This Digital Revolution hit the headlines when Chancellor Angela Merkel spoke glowingly of the concept in January 2015 at Davos' World Economic Forum (WEF). Klaus Schwab popularized it in 2016 with his book titled *The Fourth Industrial Revolution*. He explained that, compared to previous industrial revolutions, the 4IR is evolving exponentially. It combines multiple technologies leading to unprecedented paradigm shifts. It transforms entire systems across and within countries, companies, industries, and societies (Schwab, 2016) to harness converging technologies to create a seamless future. Technological progress enables machines to complete many of the tasks that once required human beings.

The 4IR is marked by emerging technological breakthroughs in several fields, including robotics, artificial intelligence (AI), nanotechnology, quantum computing, biotechnology, the Internet of Things (IoT), the Industrial Internet of Things (IIoT), decentralized consensus, fifth-generation wireless technologies (5G), additive manufacturing/3D printing and fully autonomous vehicles and automation. It is characterized by customized and flexible mass production technologies where hi-tech machines operate independently or cooperate with humans to create a customer-oriented production field.

The machine is an independent entity that collects data, analyses it, and accordingly suggests policies. It aims at creating a social network where devices communicate with one another (IoT) and or with people called the

Internet of People (IoP). Through such communication, a cyber-physical production system (CPPS) is created. In short, 4IR transforms traditional companies into Smart Factories with the help of the Internet of Things and Cyber-Physical Systems. It represents entirely new ways technology is embedded within societies or even human bodies in the so-called transhuman. The Fourth Industrial Revolution is said to be the first where technology tools could become embedded within humans, even possibly influencing the genetic makeup.

An elevated level of complexity characterizes it and network integration of product and production processes (Lu, 2017), risking a different form of inequality and insecurity despite *Industrie* 4.0 being described as a new paradigm for improving productivity and flexibility through digitalization. It is expected to deliver fundamental improvements to the industrial processes involved in manufacturing, engineering, material usage, supply chain, and life cycle management (Gilchrist, 2016). Notwithstanding, during WEF 2019, three years after the pronouncement of 4IR, the Forum was warned of an imminent battle between the robots and humans.

Moreover, the possibility that the latter could be made slaves of the former, is something that has been lingering in the minds of most for a long, long time, but no one cared until WEF once again spoke. So much so that it triggered a unique discourse on the Fourth Social Revolution as a counterbalance to the excesses of the 4IR. What do we do now? If the battle is read as one between artificial intelligence (AI) and primordial intelligence (PI), then the implications are even more severe and dehumanizing should AI subjugates the latter. After all, PI is what humans and being human is all about. Some called it *fitrah*, others *karma* or simply spiritual force. No matter. It is a testimony that we are different and consciously living so. While robots driven by AI can make no such claims, they can allegedly supersede us, raising several more unanswered questions bordering on ethics and morality! Ultimately, it is about our desires and choices driven by our collective preferences as to what we want these technologies to deliver for humanity?

The epic industrial revolution, figuratively speaking, came to question when Sir David Attenborough admitted at the 2019 WEF: The Garden of Eden is No More – to set the conference's tone (WEF, 2019). In no uncertain terms, he called on us to do more about the ever-threatening climate disasters due to unabated global warming and unscrupulous business practices. Like all Industrial Revolutions, 4IR also leaves behind noticeable negative impacts and consequences ranging from environmental pollution to climate crisis to massive industrialization and urbanization. It includes excessive deforestation, desertification, rapid population growth, water scarcity, food insecurity, and acute resource depletion. It induces fear because of high redundancies, leading to widespread stress and an uncertain future with the closure of long-established companies resulting in long-term unemployment simultaneous to the rise of yet another new economy.

In comparison, the types of jobs destroyed involve physical and repetitive tasks and those that are created or retained by the 4IR demand higher skills and specialization. *The Future of Job Report* (WEF, 2016) categorised physicians and surgeons, choreographers and anthropologists among the latter, and telemarketers, real estate brokers and referees as well as sports officials as the former. Operationally, companies enter a new wave of automation and digitalization that will significantly impact the skills needed to remain competitive. As a result, some critical areas of concern include inequality, identity, and security, directly affecting education. They can also be gender-biased.

4IR and Education

The 4IR can be summed up as an interoperable manufacturing process, integrated, adapted, optimized, and service-oriented. Unlike the first three Industrial Revolutions, it gives rise to an equivalent factory-like model to mass-produce human capital for the industry. One of the noticeable impacts of 4IR is the so-called Education 4.0 with the intention to produce graduates for a world dominated by cyber-physical systems. Education became a factory to create employment and emphasize innovation, particularly technical innovation, which is part of predominantly training the mind and training to develop new things and a better economy for innovation or the innovation economy. These three objectives may be summarized in the four Ms - Manpower, Mind, and Machine, driven by the Market. According to Chomsky, that society reduces education to the requirement of the market (Bovitch et al., 2018). Students are trained to be compliant workers. Moreover, the skills and knowledge taught are often not worthwhile, characterized as mindless, meaningless drills and exercises in preparation for multiple choice exams. This is evident through the state-mandated curriculum that standardized tests are necessary to measure student growth and educational success. Chomsky further suggests that the goal of education is to produce human beings whose values are not accumulation and domination but instead are free association on equal terms.

While traditionally, schools have been used as instruments to transmit knowledge, his view of the factory model of education is that students are mandated to adhere to state written curricula where standardized tests are necessary. Students are inadvertently pushed to learn through memorization of facts rather than critical thinking. The education process is reduced to knowledgeable educators who transfer information to those who do not know rather than help students formulate higher-level thinking skills on their own. He explains that an educated child is conditioned to obey power and structure by society's definition, where a deep level of indoctrination and obedience is imposed (Bovitch et al., 2018).

The general emphasis is on developing a workforce, inventive minds, and hi-tech machines based on innovation and technological change.

Technological change can affect the development of labor (human capital) demand both in quantitative and qualitative terms. The employment consequences, in turn, depend on the available quantity and quality of the relevant 4IR-related human capital. It has been pointed out that digitalization is core to future jobs, and AI alone is expected to boost global growth by about 15 percent by 2030. Education is all about money and material wealth. A good job and a good salary are the defining characteristics of success. Universities and higher institutions must respond to the wishes of higher education clients. No attempts are made to change students' preferences but instead treat students as customers.

Universities should offer the kinds of programs students as customers want in a way that would maximize profit. As in the factory, Key Performance Indicators (KPIs) are used to evaluate the level of success in meeting targets laid down by the organization, where staff members would resort to any means, fair and foul, to meet the requirements of the set KPIs in terms of monetary and materialistic value. This kind of education is dubbed education without a soul. The "factory mass teaching methods of the third revolution era have failed to conquer enduring problems of inequity and unfairness" (Sheldon & Abidoye, 2018, 22).

What is clear, such a trend pushes us to a new Anthropocene era where humans are designing their extinction slowly but surely by undermining their civilizations. For the longest time, humans under the Holocene age have been toiling to build new inhabitable spaces, turning them into cultures as we know them today. It was supported by stable climatic conditions with minimal fluctuations, enabling humans to progress by balancing one civilization with another and linking humankind into an interconnected global community. It, however, is currently being slowly dismantled by strained ties and the recoiling into cocoons protected by me-first attitudes and policies to the detriment of others, particularly the weak and marginalized. Several years ago, bodies like Oxfam persistently reminded us that the world's assets are increasingly concentrated in the hands of a small group of (white) men residing in the Western hemisphere.

Chomsky likened this to the Requiem for the American Dream. Others predicted the rise of a new social class, the precariat, in the future workplace. The overall orientation of education in the contemporary world can be summarized in a five-letter word, WEIRD (Dzulkifli et al., 2019). It is Westernized (as per the initial Industrial Revolutions), Economic-centric, Industry-led, Reputation obsessed, and hence a Dehumanizing exercise. It is expected that the demand for technological skills (both coding and especially interacting with technology) is expected to rise by more than 50 percent, and the need for complex cognitive skills is set to increase by one-third. Demand for high-level social and emotional skills, such as initiative-taking, leadership, and entrepreneurship, is expected to rise by more than 30 percent.

Students should develop their "moral, civic, and creative capacities" (Fish, 2008, 11). Educational institutions are about articulating ideas

and recognizing one's responsibilities to those ideals. They should help develop capacities for integrity and courage, diligence and self-sacrifice, commitment and service to others, and a sense of higher purpose. In other words, WEIRD needs to be replaced with a more wholesome, inclusive, sustainable, equitable, and resilient framework, WISER: Worldwide, Inclusive, Sustainable, Equitable, and thus be *raḥmatan Lil' ālamīn* (mercy to all, Figure 1).

It will lead to a more just and humane world as a higher purpose of life. It must take the lead for Education 2030, focused on The World We Want to be aligned to UNESCO's Pillars of Learning for the 21st Century, namely: learning to know, learning to do, learning to live together, learning to be, and more recently, learning to become with a stronger sense of personal responsibility for the attainment of common goals (UNESCO, 2014, 93). Learning to become requires reimagining the strategies to realign knowledge and understanding in shaping the future of humanity and the planet. The existing fragmented approach to (higher) education brought about an imbalance between the first three of the 5Ps - Prosperity, Planet, and People and impacted the remaining 2Ps, Peace and Partnership. Therefore, urgently required to bring back much-needed balance in 5Ps based on Education 2030. It supports the 2030 Agenda for Sustainable Development in providing a new framework for (higher) education to develop inter-institutional and holistic collaborations in pursuit of Education for Sustainable Development (ESD). It desires a more humane and humanistic value to fashion education of the future, as shown in Figure 1

Figure 1: WEIRD and WISER
Source: Office of the Rector, IIUM.

WISER

WISER seems apt for a STAR (Society of Transnational Academic Researchers) conference held at the end of 2020. Chomsky is well known for his moral stance against injustice, discrimination, and all deemed inhumane. His work is not limited to language but also covers politics, establishing him as a pre-eminent public intellectual and one of our time's most original and wide-ranging political and social critics. Since the 1990s, Chomsky has been recognized as the leading dissident voice worldwide. He ignited the spirit of intellectual and academic freedom in the fight for social justice and human rights for almost half a century. His scathing critique of current crises - ranging from media to aggression, especially involving the United States, has inspired many scholars and citizens globally. In *Manufacturing Consent,* it is argued that

> the mass communication media of the US are effective and powerful ideological institutions. It explains the richness of linguistic knowledge and how quickly it could be acquired through its creative use, at times with only minimal exposure to the language presented by their environment. It could be the model for the manufacture of public consent when wrongly applied to conveying information and knowledge through a WEIRD educational institution. It carries out a system-supportive propaganda function, relying on market forces, internalized assumptions and self-censorship, without overt coercion. (Herman & Chomsky, 1988,306).

It is equally valid in the case of the WEIRD education model. It is a form of soft power to colonize the mind using subtle language. Chomsky stressed the complexity of internal representations encoded in the genome and their maturation in light of the correct data into a sophisticated computational system, which cannot be usefully broken down into a set of associations (Katz, 2012).

In other words, WEIRD needs to quickly give way to a WISER approach, as mentioned above. It calls for a just and humane world as a higher purpose of life through a more cohesive academic and intellectual solidarity that public intellectuals like Chomsky push for tirelessly. Indeed, Chomsky describes society today as a modern industrial civilization and the driving force in this modern industrial civilization as material gain (Chomsky, 2007). A culture based on economic and material growth principles is in danger. Chomsky advocates that if modern industrial society were to aspire to change, the condition of survival requires social planning in the interest of the community and global community (Olson & Faigley, 2007), akin to the concept of *rahmatan Lil Alamin*. It means a society would need first to consider the mutual interest of the community rather than their self-interest in social planning (Chomsky, 2008). Chomsky makes a similar connection concerning educational institutions today.

Accordingly, schools, colleges, and universities are like factories in today's educational institutions. Liberal elites or intellectuals indoctrinate students to increase their obedience and conformity. "The 'liberal elites' or 'intellectuals are the ones who write history' used in schools and 'we should be cautious about the alleged 'lessons of history in this regard; it would be surprising to discover that the version of history presented is self-serving and indeed it is" (Arnove, 2008, 253). Chomsky considers educational institutions today to be where "human beings have no intrinsic, moral and intellectual nature, that they are simply objected to being shaped by state and private managers and ideologues - who, of course, perceive what is good and right" (Arnove, 2008, 253). Instead, educational institutions should be interested in "what the student discovers for themselves when their natural curiosity and creative impulse are aroused not only will be remembered but will be the basis for further exploration and inquiry and perhaps significant intellectual contribution" (Arnove, 2008, 234). In other words, an encroachment on human rights in society goes against our instinctual human nature. Slavery and women's rights are examples of these infringements (Bovitch et al., 2018).

In similar ways, this is supported by the International Association of Universities (IAU) in framing the 2030 Agenda for Sustainable Development. It is further enhanced by providing a "new" framework for universities to develop inter-institutional collaborations to pursue the Education for Sustainable Development (ESD). IAU strongly advocates the potential use of technology and enhanced access to relevant knowledge and education. Consequently, IAU has asked higher education leaders to embed SD concepts and principles in strategic planning, academic, and organizational work. IAU aims to ensure quality education and promote lifelong learning and life-wide learning opportunities. Both desire a more human-centric and humane dimension to fashion education of the future. However, the impact of improving higher education is unevenly distributed and delivered, and IAU is concerned about exacerbating present or future inequalities.

Whole Person Education

From the analysis done by Bovitch et al. (2018), Chomsky seems to argue that the value of education should be placed on students' critical thinking skills and gaining valuable and applicable knowledge. They propose the concept that if a human is genetically sound, they will be able to develop these abilities regardless of other circumstances, such as where they were born or to whom they were born. The naturalistic and innateness of our nature will allow humans to obtain and use capacities such as thinking, reasoning, and communication. In addition to his realistic view of humans and their abilities to think and communicate, these traits are universal, especially concerning morality, that can be found across different cultures. Chomsky (1998) supports this idea with the fact that people of different

cultures can, and do, find common ground on which to have discussions, as he states in an interview with Soper (1998):

> "We can begin to see human nature to develop certain mental traits in specific capacities.
>
> We can go further than this and begin to discover universal aspects of these traits determined by human nature. I think we can find this in morality." He builds and extends this universal morality to every culture and individual and states that they do the things they do to enhance human life."

In this sense, the COVID-19 pandemic is a reminder for us to respond to the shocks to the world's education system. It is the opportunity to find new ways to address the learning crisis and bring about a set of solutions. There is an urgent need to replace the four Ms models with four Hs to embrace the challenges of the 21st Century, as shown in Figure 2. The is call is to:

1. Broaden Manpower for employment to humanity and sympathy, a feeling of pity and sorrow toward the misfortune. Furthermore, to stand in solidarity with the vulnerable and the marginalized.
2. Complement Mind and innovation with Heart and empathy, which is an ability to understand, acknowledge, and experience the feelings of another. More so, to participate and be engaged in providing real-world support to those affected by translating knowledge into real solutions.

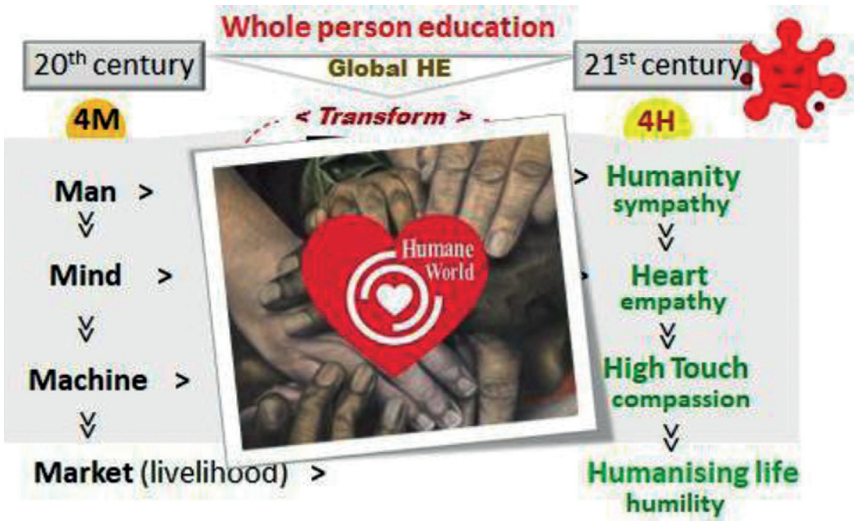

Figure 2: Pre and Post 4IR Education models.
Source: Office of the Rector, IIUM.

3. Combine machines driven by Hi-Tech with Hi-Touch, which according to Daniel Pink (2005, 2), "we are entering the age animated by a new form of thinking. It is a new world where an aptitude for high concept and high touch is highly prized." He defined hi-touch as "the ability to empathize with others, understand human beings' subtle yearnings and interactions, and pursue beyond every day for a new purpose and meaning" (Pink, 2005, 17). Furthermore, Mengzi, a Confucian philosopher, regards one without a mind directed by compassion as one who is not human. While he devotes most of the discussion to benevolence and righteousness, the former manifests in the affection one has for their kin, compassion for the suffering of other humans, and even concern for non–human animals (Van Norden, 2008, 46). In addition, emerging hi-technologies in biology tend to bring up the old-age question about what it means to be human, let alone be humane?

In short, there is a dire need to cultivate a double consciousness so that people need not either reject technology or be swept by it entirely. It alerts humankind to the dangers of aping something blindly. There must be a balance between technocentrism and anthropocentrism. Technocentrists have absolute faith in technology and industry; anthropocentrism, on the other hand, believes that humans are the primary holders of moral standing. There is a need to balance the two in addressing social and ethical concerns as part of a new governance model to ensure that the world remains humane. The world needs to focus on technology, science, humanity, creativity, and ethics. Humans must harness and harmonize the

Figure 3: Balance between technology and science and humanity, creativity, and ethics.
Source: Office of the Rector, IIUM.

opposite forces of matter and mind, body and soul, head, heart, visible and invisible, and technology and ethical values. Educators must cultivate double consciousness to humanize technology through a bold vision of moderation and middle ground (Dzulkifli, 2018). Jalaluddin Muhammad Rumi's dictum is well-worth following: The middle path is the way to wisdom, as shown in Figure 3.

Conclusion

The first three Industrial Revolutions provided evidence for the profound shifts in society, the economy, and education, resulting in the proliferation of curricular innovation and new and unsustainable educational institutions. Unlike previous Industrial Revolutions, the 4IR is characterized by several compounding exponential technologies with the capacity for rapid increases in scale. This rapidity demands an appropriate initiative-taking response from the educational sector. The 4IR challenges fundamental assumptions of what it means to be human and the conditions of the relationship between the human and the natural world.

Education plays a significant role in shaping humankind in the future. Educators must be courageous enough to assert their humanity over a piece of manufacturing technology that tends to dehumanize the human species. Students should be aware that humans still have many advantages over their automated counterparts if they possess qualities that every human should have, such as wisdom, spirituality, empathy, self-awareness, and curiosity. Technology need not be rejected, but those responsible for education must harness and harmonize the opposite forces of the four MS, of workforce, mind, machine, market, and blend these with the four Hs of humanity, heart, high touch, and humanizing life. Likewise, the WEIRD education model is replaced with a more resilient framework summarized as WISER, towards the vision of moderation and the middle path in achieving wisdom for all humankind.

For example, it is not a coincidence that Japan has been talking about Society 5.0 instead. More ironic coming from a very technologically advanced nation. It is where reshaping a humane world comes into the picture as a platform to balance and moderate the various points of view and context, especially from the perspectives of Eastern traditions and wisdom.

In other words, a more organized platform is needed to provide a larger vista towards a humane world, such as the STAR conference, to articulate what others are unwilling or even failing to do. At once, we need not jump onto any bandwagon at the snap of a finger until we are fully informed of the possible outcomes, especially those with a so-called revolutionary proposition.

In sum, as highlighted in a UNESCO report, Thinking Higher and Beyond Perspectives on the Futures of Higher Education to 2050 (2012), higher education is regarded as an ecosystem in which its purposes, missions, connections, institutions, traditions, and resources are shaped by

and in turn influence the historical, social, political, and cultural contexts in which HEIs are based (UNESCO, IESALC, 2021). Conceptualizing higher education in this interconnected way helps one think about a new ecosystem where people will live together in a better world (Dzulkifli, 2021). In the higher education ecosystem, HEIs in the future will be distinguished from each other instead of by how they take responsibility, each with its mission, traditions, resources, and means to interact with those ecosystems (Brunner, 2021).

To do this, HEIs may take an institution-wide approach toward integrating holistic and well-aligned programs into the local context (Dzulkifli, 2021), enhancing collaboration within the institution to drive the vision and plan for the vision change. Not only an ecosystem by itself, but higher education has also to become more connected, externally and internally, with the ecosystems with which it is entangled (Barnet, 2021) in such policies as 8 Article 13, International Covenant on Economic, Social and Cultural Rights (1966), other social institutions, and the economy. One such ecosystem is education: any considerations about the missions and purposes of higher education cannot miss the inescapable connections to primary and secondary teaching and lifelong learning. For learners to flourish in and beyond higher education in 2050, values and organization of all levels of education should be connected. Embracing all levels of education would allow everyone to develop their potential and thrive in a circular and regenerative system (Assié-Lumumba, 2021).

As connectivity for higher education in 2050 may be in the field, different stakeholders should contribute to HEIs' internal ecosystem and the ecosystems that higher education plays a role in at local, national, regional, and international levels. Higher education is not isolated; it could expand its role in coordinating various sources to push for developers to connect the world as a whole. In this way, all are interconnected, and our sense of ethics should be toward humanity (Rizk, 2021).

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