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PREPARING HUMAN CAPITAL IN THE FOURTH INDUSTRIAL REVOLUTION

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Abstract: The focus of the Fourth Industrial Revolution has been on its implications on Human Capital and its need to develop *"21st-Century Skills"* through education to ensure future labour and capital complementarity. The World Economic Forum estimated that 65% of the children entering primary school today will work in completely new jobs when they will enter the labour market. Employers start to have as a major objective to increase labour productivity and innovation. They look for new skills, which are scarce, willing to attract, engage and retain in their organizations people that demonstrate attitudes like resilience, responsiveness to change, entrepreneurial mind-set, and willingness to innovate. While corporations, in their attempt to increase productivity, restructure and lay off people, entrepreneurship becomes a hope for a better living. On the other hand, the human resources market will start soon to be dominated by millennials, having to work together with people from X generation. Thus, this paper attempts to discuss the impact of the Fourth Industrial revolution on human capital. Another goal is to discuss on how to develop human capital in the future with the relevant skill for the fourth industrial revolution. The paper might be of interest for government, educators, training providers, employers, and workers.

***Keywords**: Human Capital; 4IR; Higher Education*

INTRODUCTION

A report from the World Economic Forum (2016) about the future of work stated that "*by one popular estimate, 65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist.*". Schwab (2016) predicts an optimistic future where technological innovation – and our ability to harness it – becomes a powerhouse for social and economic growth. Schwab argues that 4IR developments are affecting all disciplines, economies, industries and governments, and even challenging ideas about what it means to be human.

During the Industrial Revolution, the worry was about the dehumanising effects of work. The greater fear is a world where the elimination of work itself is the source of dehumanisation as a result of income insecurity and declining social agency. On the other hand there's a concern that the epoch of major technological progress is behind us. Robert Gordon in his book, "The Rise and Fall of American Growth: The US Standard of Living since the Civil War" (Princeton University Press 2016), argued that

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the productivity growth of western economies will be held back by the headwinds of rising inequality, stagnating education, an ageing population, and the rising debt of college students and government.

A study by McKinsey in January 2017 found that about 30% of tasks in 60% of occupations could be computerised and in 2016. The Bank of England's chief economist said that 80 million US and 15million UK jobs might be taken over by robots (Haldane, 2017). In 2013, a study by Oxford University academics called The Future of Employment examined 702 common occupations and found that some jobs – telemarketers, tax preparers and sports referees – are at more risk than others including recreational psychologists, dentists and physicians.

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Goode (1959:147) defines Human Capital in broad terms as the *"... knowledge, skills, attitudes, aptitudes, and other acquired traits that contribute to production".* Mankiw (1995:298), on the other hand, distinguishes between knowledge and Human Capital, stating that knowledge is *"society's understanding about how the world works"*, whereas Human Capital is *"the resource expended transmitting this understanding [Knowledge] to the labour force".*

As workers, they have to commit to a lifetime of practicing and updating their skills by taking extra courses online and in classrooms. Lifelong learning, agility and continued training and retraining are key. Governments also need to create a climate where entrepreneurs can flourish, because new ventures create new jobs. The answer to the new and growing workforce of robots is not to slow the pace of technological progress, but to speed up our institutions so that entrepreneurs, managers and workers alike can thrive.

Education and lifelong learning will be of vital importance to equip present and future generations to not only be a productive part of this new world but also to meet the societal challenges presented by the 4IR, and the existential challenges presented by climate change and population growth.

Alvin Toffler, an influential American writer and futurist, is quoted as saying: "*The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.*" This begs the question about the role of formal education systems are performing today. For example, are students learning how to learn or are they learning how to pass tests?

According to the WEF "Future of Jobs" report, the top ten skills that will be needed in order of priority by employers by 2020 are: complex problem solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, judgment and decision making, service orientation, negotiation, and cognitive flexibility.

The skills that had been identified as needed in 2015 that are no longer included in the top ten list were active listening and quality control. Cognitive flexibility and emotional intelligence were the two new skills added for 2020 to replace them. This is because as work becomes automated, it will also become much more fluid. Employees will need to be agile and able to jump between very different types of tasks and contexts. HE needs to change to better prepare thinkers of the 4IR.

Though the 4IR is staged to drive inclusive benefits, it could also challenge our society and hinder (social/socio-economics) development by replacing human capital with machines. The workforce, therefore, needs to have greater access to higher education and education of quality. Low-skilled work will become scarcer in the future as predictable tasks are replaced by machines. Both high-skilled and low-skilled workers need to be either retrained or educated differently. The fast advancement of various technologies has led to partial or full automation of many job positions.

According to Gleason (2018), even in a fully automated working environment, humans are still indispensable. When new technologies are firstly introduced, humans are needed to finalize and coordinate implementation tasks. When systems are put into operation, people need to perform a set of non-straightforward maintenance duties. Humans also have the capacity to upgrade their skills by taking over the jobs when automation fails. This analysis can help us to reach the conclusion that human capital is not out dated in the era of 4IR, but it requires enhanced training. From the first to third industrial revolutions, machines outperformed humans in terms of mechanical tasks. However, in the 4IR there is shift in the duties associated with human labour, from mechanical tasks to cognitive tasks. Osborne and Frey (2013) stated that AI-based algorithms for Big Data are becoming a substitute, in the workplace, for a wide range of non-routine cognitive tasks.

Koi (2015) and Hodgson (2016) argue that there is a growing need to develop a skill set that is less susceptible to automation, which involves creativity, intuition and human judgement. Their view aligns with Schwab (2016) who too argues that Human Capital will need to reskill to keep pace with changing technology. As noted by Schwab (2016) the Fourth Industrial Revolution Industrial is need to develop what the World Economic Forum (2015) refers to as *"21st-Century Skills"*. These are the set of abilities that all forms of Human Capital will need to succeed in the Fourth Industrial Revolution. These skills are a set of abilities that are broadly characterised into three categories, namely: Foundation literacies, competencies, and character qualities (World Economic Forum, 2015). The World Economic Forum (2015) states that there has been a radical shift in the global marketplace toward a skill set that needs to be able to deal with unstructured problems, analyse information and collaborate with new technologies. This skill set is in desperate need due the increasing automation and digitisation of previously manual and routine labour.

O'Connor (2016:1) suggests that due to artificial intelligence's methodical approach to problem-solving, there needs to be a shift towards more creative education investment, because humans still have superior ability over machines when it comes to exercising intuition, creativity and persuasion, encompassed by the concept

"emotional quotient"or *"EQ".* This suggestion aligns with Hodgson's (2016) notion of shifting towards the much-needed skill set that displays professional human judgement, and that is both flexible and capable of displaying empathy, creativity, and intuition.

CONCLUSION

Schwab (2016) argues that the development of 21st-Century Skills must be achieved through education and re-education of existing workers. When referring to the working definition of Human Capital, it is stated that *any investment in Human Capital is achieved through both education and training.* Therefore, it is necessary to scrutinise the relationship between education and Human Capital.

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