International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

The Fourth Industrial Revolution & Human Capital Development (Analytical study in Iraq)

[1] Ahmed Ibrahim Hussein

ABSTRACT: *The problem of research comes from the fact that Iraq is one of the countries with great wealth and material and human resources, which can be used efficiently to achieve social welfare and thus human development generally. This research aims to show impact of 4IR on Human Capital Development in Iraq by Utilization of statistical data published by the United Nations - development program as well as data of the World Bank team related to the research topic .People in Iraq can be more productive, flexible and innovative by Optimal Utilization . Utilization is the degree to which a Resource such as Equipment , Space , Workforce (Human Capital) … etc. is currently being used and is measured as Ratio . Investments in Human Capital have become more and more important as the nature of work has involved in response to Rapid Technological Change . there are four drivers of change in Manufacturing : (Market Forces , Capabilities , Resources and Policy) . the speed and measure of changes coming about by the Fourth Industrial Revolution . these changes will being about shifts in Power , shifts in Wealth and Knowledge . Many ways deals with investments in Human Capital : (Education , Training and Development) . this introduction summarizes the purpose , scope and structure of Researcher image to develop Human Capital in Iraq within benefit of advantages for The Fourth Industrial Revolution in world .*

Key words : *The Fourth Industrial Revolution , Human Capital , Development*

I. INTRODUCTION

The Forth Industrial Revolution (4IR) , a recent term coined by Claus Schwab , founder and executive chairman of the World Economic Forum , it describes a world where individuals move between digital domains and offline reality with the use of participated technology to enable and re- arrange their lives . (Min etal., 2018 : 90)

There are three reasons why transformations of today represent not merely a prolongation of the Third Industrial Revolution to arrival of a Fourth Industrial Revolution and distinct one (velocity , scope , and system impact) and depth of these changes in the transformation of entire systems of production , management and governance . (Schwab , 2015) .

Human development is about human freedoms. It is about building human capital by capabilities—not just for a few, not even for most, but for everyone. In 1990 United Nations Development Program (UNDP) published the first Human Development Report (HDR). Since then, it has produced more than 800 global, regional, national and sub national HDRs and organized hundreds of workshops, conferences and other outreach initiatives to foster

[1] Assistant Lecturer Ministry of Higher Education and Scientific Research
Baghdad – Iraq

Received: 15 Jan 2020 | Revised: 5 Feb 2020| Accepted: 30 Mar 2020

human development. These activities have extended the frontiers of analytical thinking about human progress beyond economic growth, firmly placing people and human well-being at the centre of development . (Human Development Report Office , 2018 : 1)

The 2018 Statistical Update presents the 2017 Human Development Index (HDI) (values and ranks) for 189 countries and UN-recognized territories, along with the IHDI for 151 countries, the GDI for 164 countries, and the GII for 160 countries. It is misleading to compare values and rankings with those of previously published reports, because of revisions and updates of the underlying data and adjustments to goalposts. Readers are advised to assess progress in HDI values by referring to table 2 ('Human Development Index Trends') in the 2018 Statistical Update. It is based on consistent indicators, methodology and time-series data and, thus, shows real changes in values and ranks over time, reflecting the actual progress countries have made. Small changes in values should be interpreted with caution as they may not be statistically significant due to sampling variation. Generally speaking, changes at the level of the third decimal place in any of the composite indices are considered insignificant.(http://hdr.undp.org/en/data)

II. THEORETICAL LITERATURES

1. Opportunities and Challenges of the Fourth Industrial Revolution

According to review some studies that deals with 4IR ; The speed and measure of the changes coming about by the fourth industrial revolution are not to be ignored. These changes will bring about shifts in power, shifts in wealth, and knowledge. Only in being knowledgeable about these changes and the speed in which this is occurring can we ensure that advances in knowledge and technology reach all and benefit all .(Min , 2018 : 90)

Leading researchers argue that the fourth industrial revolution will shape the future through its impacts on government and business. People have no control over either technology or the disruption that comes with the fourth industrial revolution. However, we can predict the opportunities that comes with the fourth industrial revolution:

- lower barriers between inventors and markets,
- more active role for the artificial intelligence (AI),
- integration of different technics and domains (fusion),
- improved quality of our lives (robotics) and (the Internet)
- the connected life

We have recently entered the dawn of the fourth industrial evolution, in which it differs in speed, scale, complexity and transformative power compared to previous revolutions. This article has examined the opportunities and challenges that are likely to arise as a result of the fourth industrial revolution. As industrial revolutions have moved from the mechanization of production in the first industrial revolution, to the mass production in the second, and then to the automation of production in third, the standards of living for most people around the world have greatly improved. Undoubtedly, the capability of advancing technology coming forth from the latest industrial revolution has the potential to make even bigger and greater improvements on every aspect of our lives changes than the first three industrial revolutions summed together On the other hand, there are a variety of challenges stemming from the fourth industrial revolution to overcome From income inequality to cyber-

security, the benefits of the fourth industrial revolution have obstacles that must be harnessed, directed and overcome, such as income inequality, cyber-security, and ethical dilemmas. Technology and advancements in science drive transformation around the world. They create ripple effects on societies, institutions and economies. They will transform the ways in which we live, work, and interact with one another. Understanding these new technologies and their disruption potential is critical for all nations and especially developing countries The fourth industrial revolution may affect society and economy in a variety of ways. (Prisecaru 2016) :

First, a large portion of people around the world are likely to use social-media platforms to connect, learn, and change information

Second, a variety of innovative producers and competitors will have easy access to digital platforms of marketing sales, and distribution, thereby improving the quality and price of goods and services.

Third, consumers will be more and more involved in the production and distribution chains. The main effects of this revolution on the business environment are the impact it will have on consumer expectations, product quality, the move toward collaborative innovation, and innovations in organizational forms .

2. Definitions and Concepts of Human Capital Development (HCD)

The concept of human capital refers to the abilities and skills of human resources of a country while the human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience that are critical for economic growth and development of a country (Okojie, 1995 : 44-45). Human capital includes general skills of managers, knowledge of organization-specific technology, management skills specific to the organization, and efficient communication skills with co-workers (Kim and Park, 2013: 198-210).

Therefore, human capital is recognized as an important factor that could affect the success of organizations (Becker, 1993:) and the most successful organizations depend on intangible advantages such as human capital that is more difficult to imitate and to transcend. Consequently, human capital influences the performance of organizations in strategic management (Hitt et al.,2001: 13-28) . The concept of human capital has been developed over a long time. In 2002 emphasized that human capital consists of the knowledge, skills, abilities, attitudes and experience required to accomplish the mission of an organization. From the strategic human resource perspective, assuming that not all existing knowledge and skills are strategic, the first step is determining what forms of human capital exist in the organization and how they can be a source of competitive advantage (Huange et.al,.2002 : 357 – 373)

The term human capital came from human capital theory which refers to the knowledge, skills and attitudes that are developed and valued primarily for their economically productive potential (Baptiste, 2001 : 184-201). Human Capital is described as the knowledge, skills, abilities and other characteristics that an individual possesses and which can be put to a productive use (Ployhart, 2004 :127-150) . Human capital forms an organization’s critical resource base (Pfeffer, 1994) which is most vital to a firm and reflects on the individual’s knowledge, experiences, capabilities, know-how, skills, ideas, creativity as well as innovation (Edvinson and Malone 1997). This adds value to an organization’s ability to solve problems and make vital decisions under complex and innovative circumstances(Bohlander and Snell, 2007 and Aryee et al., 2012 : 267-285)

Various terminologies have traditionally been used to describe human capital development in times past. It includes such terminologies as training, development and education. Mondy and Noe (1990) have defined human capital development as "planned and continuous process of helping employees to become better at their tasks, knowledge and experiences through training, education and development programs It can be deduced from the definition by Mondy and Noe (1990) that HCD is planned and continuous effort of organizations to enhance employees' task performance, knowledge and experiences. Bohlander and Snell, 2007) consider HCD as "primarily designed to benefit both organizations and employees through: improving employees' task performance and supporting employees' knowledge and experience development". Armstrong (2006) on the other hand considers HCD as "processes that direct and guides individuals and teams so that they are equipped with the requisite skills knowledge, competence needed to undertake organizational tasks As elaborated in Armstrong's (2006) definition, "HCD requires an effective leadership for introducing, directing and guiding individuals and teams". This makes the role of employees' immediate supervisors is indispensable. The indication is that HCD is a process which encompasses all individuals and teams for improving the skills, knowledge and competences. Armstrong also make the point that, "the definition implicated that HCD is primarily designed to satisfy current and future tasks requirement of an organization Harris (2008) also describes HCD as organizational learning activities aimed at improving performance and personal development in order improve individual, his job and the organization , In the argument of Harris (2008), explained that HCD encompasses three main issues: "the areas of training and development, promotion and professional growth and organization development; improving employees' job performance and personal growth; and improving personal growth within the organization". According to Harris (2008), this makes the assumption that employees cannot be treated as commodities to be hired and discarded depending on short-range whims of the organization the driving force of HCD . Gupta (2001), recognized HCD in the organization context as a process by which the employees of an organization are helped, in a continuous and planned way to: "acquire or sharpen capabilities required to perform various functions associated with their present or expected future roles; Develop their general capabilities as individuals and discover and exploit their own inner potentials for their own and/or organizational development purposes; and Develop an organizational culture in which supervisor-subordinate relationships, teamwork and collaboration among sub-units are strong and contribute to the professional well-being, motivation and and pride of employees . Purposes of Human capital development System

Armstrong, 2006 defines an HCD system to comprise of four focal branches (Individuals, Dyades (employee-boss), Team, and Organization) and four agents of HCD (Employee, Immediate boss, HR department, and Organizations). According to him, the fundamental purpose of the HCD system is to enhance resource capability as the human capital of an organization is seen as a major source of competitive advantage , It is therefore about ensuring that the right quality people are available to meet present and future needs. This is achieved by producing a coherent and comprehensive framework for developing people. Furthermore, Carter et al., (2002) have mentioned specific purpose of HCD as: to develop intellectual capital and promote organizational, team and individual learning by creating a learning culture – an environment in which employees are encouraged to learn and develop and in which knowledge is managed systematically (Carter et al., 2002 . The general purpose of HCD as explained by other theorists is to provide training and development activities, which aims at developing the capacity of an employee and to a largest extent enhance his development through processes that leads to organizational

effectiveness. However, development and change have to be embedded within an individual before progressing into teams and organizations. Armstrong (2006) stressed that change in an organization always involves changing the individual and is first focused on individual development (Haslinda, 2009 , In addition to the view of Armstrong (2006), Gupta (2001) has mentioned the following as the main purpose of HCD systems: developing the capabilities of individuals and employees in their respective roles in the present as well as in the future and to develop relationship, team spirit and collaboration in every unit of the organization together with the total self-renewal and enabling capabilities of everyone in the organization , Evidence from Gupta (2001) shows that in order to achieve the above mentioned objectives of HCD system, human resource management functions need to work in coordinated.

3. The Human Capital Index

This index adapted from World Bank team . it measures the human capital of the next generation, defined asthe amount of human capital that a child born today can expect to achieve in view of the risks of poor health and poor education currently prevailing in the country where that child lives. The HCI has three components:

first: Survival. This component reflects the fact that children born today need to survive until the process of human capital accumulation through formal education can begin. Survival is measured using the under-5 mortality rate.

Second : Expected years of learning-adjusted school. Information on the quantity of education a child can expect to obtain by age 18 is combined with a measure of quality: how much children learn in school based on countriesrelative performance on international student achievement tests. Thiscombination produces the expected years of learning-adjusted school. By adjusting for quality, this component reflects the reality that children in some countries learn far less than those in other countries, despite beingin school for a similar amount of time.

Third : *Health.* This component uses two indicators for a country's overall health environment: (1) the rate of stunting of children under age 5; and (2) theadult survival rate, defined as the proportion of 15-year-olds who willsurvive until age 60. The first indicator reflects the health environmentexperienced during prenatal, infant, and early childhood development.

The second reflects the range of health outcomes that a child born todamay experience as an adult.The health and education components of the index are combined in a way that reflects their contribution to worker productivity, based on evidencfrom rigorous microeconometric empirical studies. The resulting inderanges between 0 and 1. A country in which a child born today can expectto achieve both full health (no stunting and 100 percent adult survival) anfull education potential (14 years of high-quality school by age 18) will scora value of 1 on the index. Therefore, a score of 0.70 signals that the productivityas a future worker for a child born today is 30 percent below whacould have been achieved with complete education and full health. Becausethe theoretical underpinnings of the HCI are in the development accountinliterature, the index is linked to real differences in how much income a country can generate in the long run.6 If a country has a score of 0.50, thenthe gross domestic product (GDP) per worker could be twice as high if thcountry reached the benchmark of complete education and full healthA

number of criteria guided the design of the index: a focus on salienoutcomes, a coherent aggregation strategy across its different componentsand broad cross-country coverage of directly measured components. Aoutcome- rather than inputs-based index is more likely to center the conversationon what matters—results—and to provide incentives for countriesnot only to invest more but also to invest better. Conversely, an indexmeasuring spending on health, education, or social protection would onlycapture dollars spent on specific sectors and not whether spending led tobetter outcomes. The need to produce a salient metric that is responsive topolicy action in the short to medium term has oriented the choice of componentstoward measuring the human capital of the next generation ratherthan measuring the stock of human capital of the current workforce, whichlargely is the result of policy choices made decades ago when the currentworkforce was of school age.Human capital has many dimensions, but the literature has recognizedthe usefulness of moving from “a large and eclectic dashboard” to a singlesummary metric.7 However, doing so requires a coherent aggregationmethod.8 Finally, the likelihood that a cross-country exercise can spur policyaction is strongly influenced by the over-time and cross-country coverageof a metric that is transparent and can be meaningfully mapped to directmeasurement.

III. DISCUSION THE RESULTS

1 . Human Development Index (HDI) in Iraq

At first , the researcher can summarized Iraqi population change on the horizon time (1955-2019) as following :-

Table(1) Iraqi population change on the horizon time (1955-2019)

Year	Population	Yearly % Change	Yearly Change	Country's Share of World Pop	World Population	Iraq Global Rank
2019	**40,412,299**	2.73 %	1,072,546	0.52 %	7,714,576,923	36
2018	**39,339,753**	2.78 %	1,065,135	0.52 %	7,632,819,325	36
2017	**38,274,618**	2.88 %	1,072,046	0.51 %	7,550,262,101	36
2016	**37,202,572**	3.01 %	1,086,923	0.50 %	7,466,964,280	37
2015	**36,115,649**	3.26 %	1,070,590	0.49 %	7,383,008,820	37
2010	**30,762,701**	2.64 %	750,855	0.44 %	6,958,169,159	39
2005	**27,008,426**	2.76 %	688,603	0.41 %	6,542,159,383	40
2000	**23,565,413**	3.12 %	671,405	0.38 %	6,145,006,989	43
1995	**20,208,387**	2.96 %	547,876	0.35 %	5,751,474,416	47
1990	**17,469,005**	2.32 %	378,522	0.33 %	5,330,943,460	46

https://www.worldometers.info/world-population/iraq-population/

Received: 15 Jan 2020 | Revised: 5 Feb 2020| Accepted: 30 Mar 2020

1985	**15,576,395**	2.67 %	384,608	0.32 %	4,873,781,796	49
1980	**13,653,356**	3.16 %	393,753	0.31 %	4,458,411,534	50
1975	**11,684,589**	3.33 %	353,321	0.29 %	4,079,087,198	51
1970	**9,917,983**	3.44 %	308,438	0.27 %	3,700,577,650	52
1965	**8,375,793**	2.82 %	217,206	0.25 %	3,339,592,688	64
1960	**7,289,761**	2.31 %	157,421	0.24 %	3,033,212,527	62
1955	**6,502,657**	2.60 %	156,693	0.23 %	2,772,242,535	64

these data shows that Iraq Global rank is decrease while Country's Share of World Population is increase , its mean human development in Iraq is not at the level required to reach the refineries of the developed countries in the field of human development despite the financial potential and the enormous human potential and available .

The HDI is a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. A long and healthy life is measured by life expectancy. Knowledge level is measured by mean years of education among the adult population, which is the average number of years of education received in a life-time by people aged 25 years and older; and access to learning and knowledge by expected years of schooling for children of school-entry age, which is the total number of years of schooling a child of school-entry age can expect to receive if prevailing patterns of age-specific enrolment rates stay the same throughout the child's life. Standard of living is measured by Gross National Income (GNI) per capita expressed in constant 2011 international dollars converted using purchasing power parity (PPP) conversion rates.

Iraq’s HDI value for 2017 is 0.685— which put the country in the medium human development category positioning it at 120 out of 189 countries and territories. Between 1990 and 2017, Iraq’s HDI value increased from 0.572 to 0.685, an increase of 19.8 percent. Table 1 reviews Iraq’s progress in each of the HDI indicators. Between 1990 and 2017, Iraq’s life expectancy at birth increased by 3.9 years, mean years of schooling increased by 3.6 years and expected years of schooling increased by 1.4 years. Iraq’s GNI per capita increased by about 65.8 percent between 1990 and 2017

Table 2: Iraq HDI trends based on consistent time series data

Year	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita $	HDI value
1990	66.1	9.6	3.2	10726	0.572
1995	68.5	9.1	4.2	4650	0.553
2000	69.2	8.7	5.0	11791	0.607

2005	68.4	10.2	5.8	10851	0.631
2010	68.5	10.4	6.4	12581	0.649
2015	69.7	10.1	6.6	17105	0.668
2016	69.9	10.1	6.7	18446	0.672
2017	70.0	11.0	6.8	17789	0.685

Source : UNDP : Human Development Indices (2018 statistical update – briefing note for countries on the 2018 statistical update : Iraq)

2. Analyzing Relationships between indicators

Table 2 illustrate coefficient of correlation between (HDI) and four measures (Life expectancy at birth , Expected years of schooling , Mean years of schooling , GNI per capita $) as following :

Table 3: Relationships between indicators

	coefficient of correlation			
	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita
HDI	0.723	0.772	0.945	0.916

- Correlation is Significant at the 0.05 level (2-tailed)

Source : researcher prepared according to outputs for SPSS VER.22

These results shows that good relationships between Human Development Index (HDI) and main four measures (Life expectancy at birth , Expected years of schooling , Mean years of schooling , GNI per capita $) , that means the human development in Iraq must be affected by these four factors . important factor is mean year of schooling

3. Limitations of Human Capital index (HCI)

One objective of the HCI is to call attention to these data shortcomings

and to galvanize action to remedy them. Improving data will take time

In the interim and in recognition of these limitations, the HCI should

be interpreted with caution. The HCI provides rough estimates of how can calculate it by (lower bound , upper bound and value)

Iraq for example has the following data :

Table 4 : The Human Capital Index and Components of Iraq 2018

ECONOMY	Probability of survival to age 5	Expected year of school	Harmonized learning outcome	Learning adjusted years of school	Adult survival rate	Fraction of children under 5	HCI

						Not stunted			
							L	U	V
IRAQ	0.97	6.9	363	4.0	0.84	0.78	0.38	0.41	0.40

Source : prepared of researcher according to World Bank data .

Iraq can be classified as one of the countries with a weak human capital development index due to the decrease in the value of the indicator mentioned above (HCI < 0.50) because impact of the reasons for the sub-components in Table 4

IV. CONCLUTIONS

This search provides contributions to the body of knowledge as follows :

1) This search provides empirical evidence that there are positive relationship between fourth industrial revolution and human capital development in developing countries such as Iraq .

2) This search provides empirical identification to concept of the Fourth Industrial Revolution ant list its Opportunities and Challenges to support decision makers in host developing countries.

3) This search shows that found strong relationships between HDI and main measures that related with human development in any country .

V. RECOMONDATIONS

Consequently, there are human capital development factors related impacts on local organizations and Iraqi people by improving quality of life by many ways , For instance, increasing productivity, upgrading of management and entrepreneurial skills, and also improving of work behaviors, ethics and culture. In addition, promotion of creative thinking and transfer of business processes is another example. The additional impacts include improvement of capabilities and performance advanced management and entrepreneurial skills, development of global development processes, and improved performance and productivity in local organizations.

A researcher also recommended , Human resources management practices can be have a positive impact on the capacity to learn . because it is often the individual who acquires a new knowledge and being a valuable human capital specific to the organization it can induce organizational learning . human capital loses its value if it is ill-managed . It is thus recommended certain actions like team work and participative policies that enhance organizational learning should be encouraged.

REFERENCES

1. Armstrong, M. (2006). " A handbook of human resource management practice" , 8thEd. Kogan Page Limited.U.S.A
2. 2-Aryee, S., Budhwar, P. S., and Chen, Z. X. (2002). " Trust as a mediator of the relationship between organizational justice and work outcomes: Test of a social exchange model. Journal of Organizational Behavior", 23 doi:10.1002/job.138
3. https://hdr.undp.org/en/data https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution. Retrieved from https://search-proquest-com.ezproxy.libraries.udmercy.edu:2443/docview/1793552558?accountid=28018
4. Baptiste, I. (2001). "Educating lone wolves: Pedagogical implications of human capital theory. Adult Education Quarterly" , 51(3) .
5. Becker, G. S. (1993) Human capital. A theoretical and empirical analysis, with special reference to education . third edition, Chicago: the university of Chicago press .
6. Bohlander, G. W. and Snell, S. A. (2007). Managing human resources, 14th edition. Mason, Ohio: Thomson-Southwestern.
7. Bohlander, G. W. and Snell, S. A. (2007). Managing human resources, 14th edition. Mason, Ohio: Thomson-Southwestern.
8. Carter A, Hirsh W, Aston J (2002). Resourcing the Training and Development Function. Report 390, Institute for Employment Studies.
9. Edvinsson, L. and Malone, M. (1997) Intellectual capital: Realising your company's true value by finding its hidden brain-power, Harper Collins, NY.
10. Gupta C.B. (2001), Human Resource Management, Sultan Chand and Sons Educational publishers, New Delhi
11. Harris, A. (2008) Distributed leadership in schools: Developing the leaders of tomorrow. Routledge and Falmer Press.
12. Hitt, M.A., Biermant, L., Shimizu, K. and Kochhar, R., (2001) 'Direct and moderating effects of human capital on strategy and performance in professional service firms: A resource-based perspective', Academy of Management journal, 44(1)
13. Huang, G.Z., Roy, M.H., Ahmed, Z.U., Heng, J.S. and Lim, J.H., (2002) 'Benchmarking the human capital strategies of MNCs in Singapore', Benchmarking: An International Journal, 9(4)
14. Human Development Report Office (2018) " Human Development indices and indicators 2018 Statistical Update" , UNDP .
15. Kim, J. and Park, J., (2013) 'Foreign Direct Investment and Country-Specific Human Capital', Economic Inquiry, 51(1).
16. Min. Xu , Jeanne M. David & Suk Hi Kim (2018) " the Fourth Industrial Revolution : opportunities and challenges " , International Journal of Financial Research , Vol. 9, No. 2 http://ijfr.sciedupress.com
17. Okojie, C.E.E., (1995) 'Human capital formation for productivity growth in Nigeria', The Nigerian Economic and Financial Review,Vol 1, No.(1) .
18. - Pfeffer, J. (1994), Competitive Advantage through People, Harvard Business School Press, Boston,

19. Ployhart, R. E., and Moliterno, T. P. 2011. Emergence of the human capital resource: A multilevel model. Academy of Management Review, 36
20. Prisecaru, P. (2016). Challenges of the Fourth Industrial Revolution. Knowledge Horizons. Economics, 8(1), 57-62.
21. Schwab, K. (2015). The Fourth Industrial Revolution: What It Means and How to Respond. Retrieved from