" The Impact Of Fourth Industrial Revolution On Education " Case of Jordan

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ABSTRACT
The study is an attempt to explain the ability of Jordanian universities to exploit the fourth industrial revolution in their educational system. A sample of (220) decision maker from five public universities during the period (2010 – 2020), has been interviewed through structured interviews prepared by the researcher.
The results showed that; Jordan universities are not aware of the major changes in the future labor market, all Jordan universities suffering from poor infrastructure, old curricula, and very limited applications of educational technologies, so, it will be difficult in the future to find jobs for their graduates.
It's recommended that our education will reach the level reached by these developed countries in their education through the effective use of the Fourth Industrial Revolution.
KEYWORDS: Fourth industrial revolution, Education, Universities, Jordan.

I. INTRODUCTION

We stand on the brink of a technological fourth revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society. The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres, there are three reasons why today's transformations represent not merely a prolongation of the Third Industrial Revolution but rather the arrival of a Fourth and distinct one: velocity, scope, and systems impact. The speed of current breakthroughs has no historical precedent. When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country and the breadth and depth of these changes herald the transformation of entire systems of production, management, education and governance.

II. RESEARCH OBJECTIVES

There are many obstaclesfacing theeducation by the outputs of the fourth industrial revolution, will our country Jordan be able to exploit the Fourth Industrial Revolution in education? Is our education geared towards addressing the existing gap because of non-compliance with this revolution, the existence of a fixed base to enter this revolution and ensure its exploitation, the extent of our readiness for the fourth industrial revolution to absorb and employ them in the field of education to serve and thrive our generations,The technical, cognitive and social readiness of technology within educational institutions? The existence of educational systems that support the Fourth Industrial Revolution, and have we developed a curriculum that is in line with this revolution and find skills that match with the job opportunities after 30 years?

IMPORTANCE

The importance of the fourth industrial revolution to reformulate the methods of education and curricula within the various educational institutions and to focus on the soft skills of the students to create generations capable of extrapolation and induction and it's very important to considering the jobs available to students in the future because this revolution will lead to increase unemployment, so we have to prepare them for all changes.

III.   METHODOLOGY

In this study data was collected through Structured interview number of questions have been asked toa sample of (220) college deans and vice presidents and presidents and Ex-deans, vice president, and presidents during the period (2010 – 2020). The total number is estimated by (800) administrators.Chosen in a convenient way from five public universities (Yarmouk, Jordan, JUST, Muta, Balqa) as shown in table (1) below:

Table (1) Sample Distribution

University	# of Academic Interviewed
Yarmouk	60
Jordan	50
JUST	40
Mutah	30
Al-Balqa	40
Total	220

these questions came to know the opinion of the participants about the impact of the Fourth Industrial Revolution on education in their universities.

Structured questions are:

1.   Will our country Jordan be able to exploit the Fourth Industrial Revolution in education?
2.   Does the existence of educational systems in your University support the Fourth Industrial Revolution?
3.   Does the existence application of the educational technology & (ICT) in your University has a fixed base to enter this revolution and ensure its exploitation?
4.   Have we developed a curriculum in your University that is in line with this revolution and find skills that match with the job opportunities after 10 years?

IV.   LITERATURE REVIEW

The transformation from the traditional systems in the fields of life to digital life is one of the most important features of civilized society. This is evidence of the progress of these societies and the follower of the evolution of life into the digital world. It is noticed that these subjects receive the attention of countries at their highest levels in an organized planning to spread information fields in all walks of life.Some countries have exploited the fourth industrial revolution in education to optimize utilization, which has been reflected in the outputs of education.

SINGAPORE

E-learning in Singapore has three plans:

"The first plan started in 1997 and was preceded by schools that offer individual experiences and initiatives in the field of technology utilization in education. The first plan was to collect these schools and build a strong communication and information environment. At the time there was no intensive use of computers. In addition to training them in the use of technology in education, which lasted for six years and achieved results and indicators of success and began to employ technology in education in a creative way, and the cost of education each student about two hundred dollars a month.

The second plan was launched in 2003 and lasted for six years. It aimed at enhancing creativity and conceptualizing schools of the future. It was applied to twentytwo schools and then one hundred and two hundred, during which I read varying rates in the use of information and communication resources in education. A school for its own needs in the field of information and communication resources to promote the principle of independence of schools and allowed each school to choose the techniques and sources of information commensurate with the possibilities and culture of its regions and the skills of teachers and students with the establishment of minimum standards and requirements for these sources and techniques and methods of employment Even the aspiration of the schools to find out the skills required of students during that plan, and actually the idea of school autonomy has led to flexibility in the application of curricula and promote greater creativity and innovation and employing more intelligent technology in Singapore schools.

The third plan, which began in 2009, revived the Ministry of Education during its consideration of its educational curricula in view of the changes witnessed in Singapore and witnessed by the world and sought to enhance the skills of analysis, thinking, communication, self-management, responsibility and social participation. The aim was to enhance the means of communication and sources of information in all subjects. This plan took the ministry an important decision by choosing four distinguished teachers in different subjects

and then taking them and training them in the skills of employing technology in the educational process. The goal was to prepare them to become mentors later in their schools.

Not only that, but the Ministry has developed a framework to guide students and their families towards these programs and technologies. This framework is a standard on which to build programs for the families of these students, and by the end of the third plan, the cost of education for every Singaporean student was $ 250 per month.

Singapore is currently preparing for a new e-learning shift, the proposed plan for 2015 (Edvantage) and its introduction in eight schools (schools of the future). Fifty applications will be available on interactive platforms, smart phone applications and tablets for all subjects and all stages. Study), It is noteworthy that there are countries that tried to apply the Singaporean curriculum in education, but took the mistake of withdrawals without reviewing the curricula and thoroughly revised without regard to the different possibilities and skills of teachers and students, and was wrong in the application of the curriculum at once without being in stages and overlooked part is important teacher preparation And provide the educational means and techniques required by this advanced approach so that the outputs of education capable of innovation and creativity and to face the changes of the world.

Singapore today is a leader in education and there are national approaches that are the result of a partnership between the Ministry of Education and several other government agencies and companies involved in education. Singapore today is a leader in science and mathematics and its students are achieving advanced positions in TIMSS. Mathematics".(1)

in order to have an effective electronic education, we must consider our readiness to apply this idea and study the factors that determine our readiness or not. The most important is the readiness of the educational institutions as content, infrastructure and readiness of the society as a culture and readiness to accept such education. As well as the readiness of the private sector, especially the telecommunications sector, and the extent of its contribution to its success. It is important to clarify that it is important that electronic readiness is important but alone will not contribute to the success of any future electronic education, As well as the culture of the community and its readiness to accept and support this type of education.

UAE

"The development of the educational and educational process in the UAE is a constant concern for the supervisors and supervisors with the aim of achieving outstanding outputs that are commensurate with the amazing developments that have reached the world's science, These outputs are intended for students who receive and interact with the educational process and its tools, and who will necessarily be the leaders of the various branches of the state and its institutions. This matter was brought to the attention of supervisors early, which prompted them to keep abreast of all the scientific research in the field of education, and always strive to get out of education from the rigid mold to link it to the requirements of the labor market and the needs of the country whose leadership aspires to reach the ranks of developed countries with the arms of its children.

The Ministry of Education has developed a number of programs and means to develop the outputs of the educational process, the most recent of which was the "smart learning" project using modern technologies. This included the various educational areas, which in turn contributed to the development of projects and programs in coordination with the Ministry.

Also This development in the field of e-learning is an important step and initiative of the Institute of Applied Technology based on scientific studies of how students interact with the techniques and the effectiveness of the use of "iPad" in education, but the application will certainly face some challenges, especially those that make the student realize that these devices came for the objectives And to contribute to the motivation to learn and develop skills and support the knowledge and make it aware of all the new, and the second biggest challenge related to the teacher and his ability to interact with the "iPad" in the educational process and make the student to benefit from this device effectively, And that for this reason they have worked on the preparation of teachers and that the training courses continue because the qualification of teachers will grow cumulatively during practice and training throughout the year."(Halawa& Others - 2012)

"Furthermore, Sheikh Mohammed bin Rashid Al Maktoum has launched the Mohammed Bin Rashid Intelligent Learning Initiative, which includes all state schools, which aims to create a new school environment that includes smart classrooms in all schools, the distribution of tablets to all students and all state schools with ultra-fast 4G networks. Specialized training for teachers and new scientific curricula in support of the original curriculum, The project is implemented in cooperation between the Ministry of Education and the General Authority for Regulating the Telecommunications Sector in the State, with direct follow-up from the Office of the Presidency of the Council of Ministers. The project achieves the goal of getting out curricula and educational materials from traditional frameworks and familiar stereotypes of textbooks to electronic curricula and technical scientific content. Continuous learning, group learning and communication with teachers, access to administrative programs, student information and data, through the world of cloud computing, and the

package of integrated smart applications, the project provides high-level communication networks, It builds on its content with flexibility and precision and speed. It relies on modern technological means that provide opportunities for constructive dialogue and fruitful cooperation between all the main parties of the process (administrators, teachers, students and parents) on the one hand, and on the other hand strengthens the school's partnership with the local community (Institutions and individuals)"(4), Among the goals set by Shaikh Mohammed bin Rashid Al Maktoum is the graduation of a generation of UAE nationals able to serve his country and meet his needs. An ambitious generation that will advance the country and elevate it, in addition to securing the best tools of e-learning and equipping schools with modern laboratories. And modernize curricula to suit the requirements of the times. The project provides training for all students online, with all necessary educational resources through the project portal. Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum also promoted information technology to open the first e-University in Dubai in the region and proved to be effective and received many international awards.

CANADA
When the second largest country in the world has only 8.3 people per square mile, it becomes easy to understand what tremendous advantage computers have become to Canada's educational system. Computers alone have enhanced the learning process in ways probably thought impossible just a decade or two ago but, when coupled with the internet, technology in Canadian education has revolutionized the typical classroom, Canada is home to some of the most modern and technologically advanced cities in the world, but those cities are few and far between. What is in between them is usually vast expanses of wilderness, farmland, prairies, plains, and mountains. And water. Those elements make traveling very far to school just too much of an ordeal for many Canadian school children.

Fortunately, putting technology in Canadian education systems to work has had the effect of erasing some of that distance, at least in theory. Students on Baffin Island cannot realistically commute to schools in Victoria or Toronto every day, but they can gain remote access to the classes and activities in those cities. And they can share what they know about their life at the top of the world with children in those southern cities, the use of technology in Canadian education may be best appreciated by students in the secondary and post-secondary phases of their educations. It's these students thinking more about life after graduation and what to do for a career that may benefit the most from vocational or advanced learning opportunities that most small towns and villages simply cannot provide, using computer technology in Canadian education brings subjects to students that might be unavailable otherwise. Today's computer-savvy school children can learn things their parents had no access to just one short generation ago, Canada certainly isn't getting any smaller but using technology in Canadianeducation has made it possible to bring students and educational opportunities closer together in ways never seen before. (https://emtec.ca)

Beginning at the very earliest stage possible, computers as learning technology allow students to learn valuable skills that will enhance their educations throughout their school years and carry forward into their adult lives and their careers. When computers were first introduced in the workplace, they were accompanied by reluctance and intimidation but these fears have vanished, partly with familiarity but, perhaps more importantly, because many of the people entering today's Canadian job force grew up with computers at hand and their use has become second nature to so many young Canadian workers, Computers are excellent learning technology tools where languages are concerned. Most Canadian students learn English as a first language but some provinces are predominantly French speaking. Regardless of province, all Canadian students are encouraged to become fluent in both languages, Using computers as learning technology, each student can work on an individual, self-paced basis without the worry of keeping up with the rest of the class. They can use a computer's audio headsets to hear the proper pronunciation of words they're unfamiliar with and get feedback on their own pronunciation by speaking into the computer with microphones.

The feedback each student gets when using computers as a learning technology for a new language is personal, private, and geared to individual levels of expertise. Learning becomes much easier and more effective when competition with other students is removed.(sadatoyamazaki - 2000)

JAPAN
Japan's e-learning experience began in 1994 with the project of a television network to broadcast educational materials via video for schools on demand through cable as the first step of distance learning. In 1995, the project of Japan, known as the "One Hundred School Project" And in 1995 the Japan Education Policy Action Committee prepared a report of the Ministry of Education proposing that the Ministry provide a regional information system to serve life-long learning in each province of Yaba As well as the provision of a center for educational software as well as the establishment of a national information center. The Commission has developed plans for the training of teachers and members of the educational bodies on this new technology, which was supported by the budget of the Japanese government for the fiscal year 1996/97, where approved the

establishment of a software center for libraries in each province and support research The development of educational software, the support of scientific research on new teaching techniques, the support of all activities related to distance learning, as well as the support of the use of Internet networks in educational institutions and colleges. A new phase of modern education Now that the countries that modern e-learning methods are applied formally in most Japanese schools.(Wahman -2016)

AUSTRALIA

There are several ministries of education in Australia. Each state has an independent ministry, so the involvement in technology varies from state to state. The unique experience in Australia is in Victoria, where the Victorian Ministry of Education developed a plan for the development of education and the introduction of the technology in 1996. The plan is to be completed by the end of 1999 after all state schools are connected to the Internet via satellite. . The state of Victoria has taken a unique, unprecedented step in forcing teachers who do not want to work with computers to retire early and leave work. Thus, 24% of the teachers were actually retired and replaced by others. The Victoria Experience is unique in terms of speed and inclusiveness. The technology is available every semester and has been praised by many, including Microsoft president Bill Gates, when he paid a private visit.The Ministry has also implemented the education technology plan in all schools so that managers, employees and students are able to :

The use of computers and the use of many applications and elements of different curricula, the use of permanent and qualified in education techniques in the activities of normal life, and in the school programs as well as the development of their skills in the use of many of the techniques of education. While 91% of schools have access to the Internet, 80% of schools currently use an internal LAN. (https://www.maghress.com)

Students must learn technical skills to navigate life and work in the 4IR successfully. They need to know how to film, make podcasts, blog, and build wikis, for example. Additionally, they need to become adept at different skills, like creativity, working in teams, innovation, time management, communication, and critical thinking. A 2020 World Economic Forum report states that "critical thinking and analysis as well as problem-solving, and skills in self-management such as active learning, resilience, stress tolerance and flexibility" are critical to business leaders. (Prather -2022)

In conclusion, higher education in the Fourth Industrial Revolution is complex and bring exciting opportunities which can potentially transform society for the better. The Fourth Industrial Revolution is powered by artificial intelligence and it will transform the workplace from tasks-based characteristics to human-centered characteristics. Because of the convergence of man and machine, it will reduce the subject distance between humanities and social science as well as science and technology. The need for a higher learning institution to respond is urgent as the power of 4IR technologies for either positive social impacts or devastating environmental damage is upon us. This will necessarily require much more interdisciplinary teaching, research and innovation. (Lupanda -2020)

Evaluating of the Jordanian educational reality in integration with the Fourth Industrial Revolution

Jordan has begun to integrate the Fourth Industrial Revolution into its educational system. According to Prof. RefatAlfaouri, Yarmouk University has begun to include the topic of artificial intelligence within the curricula, also Yarmouk University is preparing to start the distance learning program. Prof. Refat pointed out the importance of providing students with future skills and integration between these skills and practical experience.

"In 2030, the world will see total or partial adjustments to 50% of the current jobs in all areas of life, and 80% of these jobs are expected to disappear by 2050. Due to the tremendous development the world will have, the faculty and students themselves must move," he said. To the modern methods of teaching and to resort to analysis and induction and development in education in order to graduate the competencies of students and qualify them to fight the fourth industrial revolution and to establish the spirit of initiative and creativity, and also pointed out that the Jordan cannot provide employment opportunities for all graduates, which It is imperative Thinking outside the box and keeping abreast of the rapid technological developments taking place in all walks of life and harnessing this technology to develop their abilities and enter the world of entrepreneurship and enable them to lead projects that contribute to the development of society as the capital of the kingdom of Jordan and its promising future. (Odeh - 2017)

Zain, one of the private telecommunications companies, has participated in integrating the Fourth Industrial Revolution with the Jordanian educational institutions through a specialized center in which the company manages all its initiatives in the responsibility of entrepreneurship and provides all the needs that Jordanians require from advanced technological facilities and services. In addition to the TV link with 500Startups in America, by offering high speed Internet, 3D Printer, 3D Scanner, Telepresence technologies, through this platform, Zain aims to help students transform their creations into productive projects, marketed

locally, regionally and globally.and it is the first of its kind across the Hashemite Kingdom of Jordan, ZINC has expanded to include several branches located in Universities like university of Jordan, Yarmouk University-Irbid, ShamalStart Initiative- Luminus, where it will be expanding as well to include more universities in addition to schools. (https://www.jo.zain.com)

Analysis and discussion

Table (2) percentages of the answers (n-220)

Study Questions	Answers			
Question	Yes # %		No # %	
(1) Will our country Jordan be able to exploit the fourth industrial revolution in education?	115	53%	105	47%
(2) Does the existence of educational systems in your university support the fourth industrial revolution?	25	11%	195	89%
(3) Does the existence application of the educational technology & (ICT) in your university has a fixed base to enter this revolution and ensure its exploitation?	35	16%	185	84%
(4) Have we developed a curriculum in your university that is in line with this revolution and find skills that match with the job opportunities after 10 years?	10	5%	210	95%

The answer of the (220) academic leader is demonstrated in the table (2) above, and it shows that almost half the sample members believe that Jordan will be able to exploit the fourth industrial revolution in education, while the other half believe they are not able. And this represent a very week situation toward making the proper changes in the future education in Jordan.

The majority of the sample members believe that the existing educational systems in the Jordan universities is not supporting the trend changes toward the fourth industrial revolution, the current poor infrastructure and old curricula are a way behind the world academic standards. 89% of the sample agree on that as in table (2). At the same time, 84% of the sample members believe that the existing application of educational technology and (ICT) does not has a fixed base to enter this revolution and ensure its exploitation.

The requirement of the fourth industrial revolution almost not existed not only in infrastructures of the Jordan universities, but also, not in their curriculum, 95% of the sample members agree on that. Which represent a big and dangerous short back in the educational system at the Jordan universities . It is totally not acceptable that all Jordan universities are not aware of the major changes in the future labor market, and the big shift in the applications of educational technology.

V.   Conclusion

The importance of the fourth industrial revolution to reformulate the methods of education and curricula within the various educational institutions and to focus on the soft skills of the students to create generations capable of extrapolation and induction and it's very important to considering the jobs available to students in the future because this revolution will lead to increase unemployment, so we have to prepare them for all changes commensurate with the future cultural reality, and work to teach the next generation the appropriate management of time, otherwise we will face new challenges added to the current list and we will face more unemployment and leisure time!

These are some of the features that experts have mentioned about 2030, which are expected features for the near future and with the expansion of leisure time, there is no place for non-creative and non-innovators in the world of tomorrow. If we go back, we will see how many transformations have occurred only in the last 50 years, especially in the technical field, to know that we are coming to years of innovation and creativity. This will be accompanied by a different kind of economy, the independent services economy, based on individual skills in software Graphic Design, Entrepreneurship and Entrepreneurship This economy will require greater flexibility in working hours and speed to keep abreast of developments in the business model of diverse and diverse projects. The independent economy will require rapid learning, assimilation of new skills and a high level of creativity and innovation. Offering solutions and completing work and spending more on technological development with the help of a few specialized staff in each institution. However, the biggest challenge we face now as societies stuck with traditional educational strategies is a general decline in Arab educational systems and institutions because they do not enable students to acquire business skills, creative thinking, monetary and flexibility in business concepts, so it will be difficult for future institutions to find graduatesin the future markets, at the end We hope that our education will reach the level reached by these developed countries in their education through the effective use of the Fourth Industrial Revolution.

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