Industry 4.0 to education 4.0: An Indian Student Perspective

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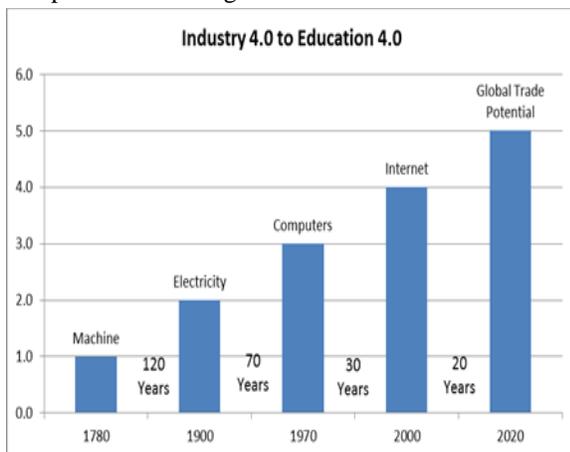
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Abstract- **Industry is a group of enterprises or organizations or companies that produce goods and provides services in an economy. The latest age of industrialization came due to the high usage of Artificial Intelligence, IoT (Internet of Things), Robotics and augmented reality in the industries. Education system gets affected by any changes that happen around the world be it in the field of technology or arts or archaeology. A Students point and his understanding is required to observed and addressed.**

Index terms- **Industry 4.0, Education 4.0, Exam Pattern, Learning Outcomes, Industrial Revolution**

1.INTRODUCTION

Change is the ultimate reality of life and Progress without change is next to impossible. The term Fourth Industrial Revolution was begat by the organizer and Executive Chairman of the World Economic Forum named Klaus Schwab. He composed a book on this title to depict a period set apart by, cited as "Technological upset that is obscuring the lines between the physical, computerized and organic circles."

Above figure shows the revolution of Industry to Education from the year 1780 to 2020. In the year 1780 the Industry mostly depend on machines that leads to Global trade potential in 2020 i.e. after a gap of almost 240 years. In 1900, there was a great change with electricity that leads to Computers in 1970 after a gap of 70 years. After 30 years educations mostly rely on computers with the help of Internets that leads to Global Trade potential in 2020 i.e. today.

Simplifying that Technologies like Artificial intelligence, autonomous vehicles and other such things are becoming grand in our day to day lives and even our bodies are not left with its touch. For instance you can think of voice activated machines, Face I'd recognition or health care sensors. But where did it all start? It has a much deeper background with it [1].

Before Industry 4.0, there were three phases of industrial revolution that humans passed through. The First Industrial Revolution started around 1760 and it was fueled by a significant innovation that is the steam motor. The result was the new assembling forms, the making of industrial facilities and the blasting materials Industry [2].

The Second Industrial Revolution started by the late 1800s it was set apart by large scale manufacturing and new enterprises like steel, oil and power. The light, phone and interior burning motor were not many of the significant creations of this period.

The third Industrial Revolution , sometimes also known as Digital Revolution occurred in the second half of the 20th century and in just a few decades, we saw the invention of semiconductors, personal computers and one of the most basic and essential use of any individual today i.e. Internet.

Past Industrial Revolutions freed mankind from utilizing creatures and it by one way or another made large scale manufacturing conceivable. The Fourth INDUSTRIAL Transformation is on a very basic

level somewhat unique. One may bring up an issue like what isolates the Third Industrial Revolution from the fourth one. At that point accurately the principle distinction is that the innovation is developing increasingly more with the human life and the Technological changes are quicker than at any other time. 3-D painting is one such model looking like this quick change in innovation [3].

In the present situation, Industries are changing quickly and inventively with assembling frameworks and mechanical applications utilized in the work field. Steady enhancements and the requirement for effective creation has made a beeline for Industry 4.0 for example the FOURTH INDUSTRIAL REVOLUTION, which will be achieved through a blend of inventive practices and approaches. Despite the fact that Industry 4.0 and INDUSTRIAL REVOLUTION are utilized reciprocally, anyway Industry 4.0 alludes to the idea of remote availability and sensors and a whole associated framework with less human obstruction which will take a shot at its own. Innovation overhauls will get streamlining different asset use and spotlight on fulfilling clients considerably over their ever progressively request. The gadgetry accommodations would bring the wearable's and installed handle huge databases for dynamic mining and understandings obsoleting the need of strain in conveying workstations or cushions. Advancement would be fruitful as it encourages snappy item created self-modified for use at the most limited improvement time [2][3].

The Fourth Industrial Revolution will greatly affect the lives of individuals, it won't just change what people do consistently yet in addition some place their world. Basically it will influence our personality and every single other thing related with it, for example, the most fundamental one is the means by which an individual builds up their own profession[4].

With Industry 4.0, two challenges will be followed:

- How to use transformations and technologies such as Robotics, 3 -D painting, printing, Artificial intelligence, virtual tools, and too with social inclusion, and
- Loss of jobs due to lack of skills and knowledge, is the greatest of all challenges.

We live in a growing world, where we people, are full of expectations and aspirations and that too in different ways. The speed of the coming together of technologies means that we have to learn new things and learn them with new and different methods. It took us so many years to move from a mere caveman to what we are today in this modern world. However, with education this time gets shortened. And this only will greatly respond to shorten the way in which the world is changing [5].

We used to go to school, now we are in University, many of us will feel that there is no need to learn anymore for the rest of our lives, but the question remains: Is it really? We have to live maybe up to 100 years and there are other generations behind us waiting to take over [6].

Also, there will be a lot of changes in our own lives, so we all need to keep learning and keep moving forward and doing it in a new way with Education 4.0. Having a backseat and enjoying won't help for a longer period of time. Industry 4.0 will have a great influence on the education sector. It is obvious that the employees of the future will need a variety of skills and upgraded knowledge system. And for that to happen, there is a requirement from educational institutions to adjust accordingly. There will be practical learning rather than conventional learning. This is also going to reduce the distances and remove differences between nations. It will work globally by conducting real time transfer knowledge and material knowledge [7].

In the future, every individual must bear the capability to know where and when to use the technology. They must be critical thinkers, problem solvers, innovators, leaders to take proper advantage of the Industry 4.0 .They must be prepared with all the challenges that this change is going to bring with it. Overall Education has no option but to adapt changes brought by upgraded technologies which gives us EDUCATION 4.0.

Basically the students need to be trained and not taught. They have to grab the knowledge and resources that will be make accessible to them by themselves. So, the need of the hour is the alignment of Industry 4.0 with education 4.0. A more flexible curriculum and structure is the least that today's institutions can serve for this change and the teachers should act like mentors. The transformation of the education industry will make it more personalized, peer to peer and a continuous process. Some of the trends that will be followed are:

1. Accelerate Remote Learning: It will enable learning anytime, anywhere as the elearning tools will change the overall concept and will imply remote learning. The classrooms will be made different whereby theoretical knowledge will be imparted outside and practical knowledge face to face.

2. PERSONALISED LEARNING: It will bring the students personalized learning depending on the capabilities and specific talents. This implies that there will be individual learning process for each student and helping them in what they possess interest. It will surely have an positive impact as they will learn according to their place. It will give a better understanding of concepts and overall a better result.

3. PROJECT- BASED LEARNING: With project-based learning the students will learn to keep a hold and polish their skills and learn how to apply them over different situations. Education 4.0 will teach them management skills, organizational skills which will help them in their Career path and further employment.

4. FIELD SPECIFIC EXPERIENCE: With technological advancement, the education curriculum will add a large number of skills focusing human knowledge and personal interaction. This will give or ensure more field experience knowledge with the existing courses. This means that the schools will provide the students, more opportunities to real world experiences that will be relevant for future internships and experiences.

5. DATA ANALYSIS: Education 4.0 will help the students to use their knowledge and reasoning to examine ongoing and past patterns or trends. It will be used for statistical analysis [8].

6. CHANGES IN EXAM PATTERN AND ASSIGNMENT: The current scenario of theory based learning and blindly memorizing all the curriculum and write those in exams will not be the trend anymore. It is essential to understand that the traditional Q&A pattern and subjective type questions only, will not help in the future. It means the above solely are not going to mark an individual, other than this more practical stuffs and experimental knowledge like projects and field works will be added.

The whole journey of a student throughout the year will be analyzed keeping the above into consideration. Being innovatively arranged is the interest of great importance than to hang tight for the correct chance to push the instructive framework to change, which will prompt time misfortune, incapacitating the economy and more youthful ages, compelled to contend even with apparent inadequate and littler frugalities. New period of Industry 4.0 will acquire an immense change in external world as in the virtual help empowered by advanced interface. Schools must reevaluate themselves rapidly. They have to adjust to the requests of RI 4 and have the commitment to come out of it and make a lot of chances to plan for the future issue. The issue later on that follows won't be of business however of the lack of aptitudes that the new openings will request. Man and machine meeting up will decrease the subject separation among humanities and sociologies just as science and innovation. As an outcome, it will essentially require significantly more interdisciplinary educating, research and development [3]

2. EFFECT ON INDIVIDUALS

Individuals build up their professions, develop abilities, meet individuals, and sustain connections. The change can be seen wherever particularly in our wellbeing and prompting an "evaluated" self, and sooner it might prompt human growth. The rundown of progress is interminable as it completely limited with the way that each must be a fan and early adopter of innovation, yet in some cases it is dreaded whether this incorporation of innovation in human lives could decrease a portion of our fundamental human limits, for example, sympathy and collaboration. The relationship with the cell phones is a valid example. Consistent association of cell phones denies one of life's most significant things: an opportunity to delay, reflect, and participate in important discussion. Individuals regularly get more associated with a virtual world than that of the real world.

One of the other most noteworthy difficulties given by new innovations is protection or individual security. Individuals intuitively comprehend why it is so fundamental, yet the following and sharing of data about them is a urgent piece of the new network.

Discussions are there seeing crucial issues, for example, the effect on our internal existences of the loss of power over our information will just increase in the years ahead. Additionally, the progressing upheavals happening in biotechnology and AI, which are reclassifying the setting of human and their reality by pushing back the present limits of life expectancy, wellbeing, discernment, and capacities, will constrain to rethink one's good and moral limits.

3. INDUSTRY 4.0 AND EDUCATION 4.0 IN INDIA

Demographic dividend may be a blessing for a country like India but on the same hand it has world's largest young populations that enter the labor market. So, according to estimates, around 50 crore populations would be added to the list of labor market by 2030. Government needs to give employment the these people, also in order to capitalize on the fourth Industrial Revolution, India has to align with the higher education ecosystem with various demands and upcoming demands of the new age. India's current job scenario is of a population where people are willing to work but they lack the skill set required for the Industries. India needs to equip some newer things in the education sector to cope up with the challenges of the new era. There will be structural and regulatory issues for sure but the biggest problem is the inadequacy of the curriculum and the non-availability of well-trained faculties. The only option left with students is to either interact directly with the experienced and trained workers or collect information through available online resources.

Government should take proper initiatives regarding this matter of well based education sector.

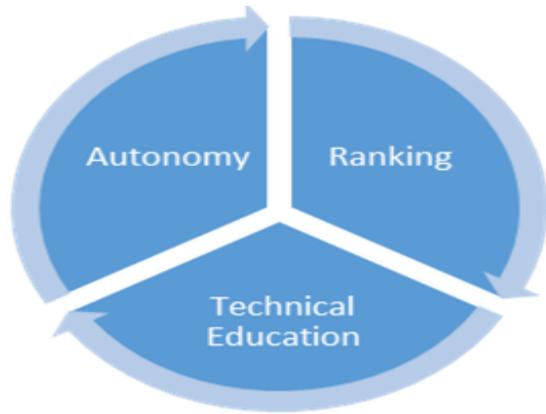Some of the initiatives taken by the government of

India to grow Education 4.0 are:

There are three important pillars
Autonomy: Graded autonomy status was granted by the UGC or the University Grants Commission. So, with this graded autonomy status, the universities or the higher education institutions has been given the freedom to launch there in there new courses that means flexibility in order to launch new courses, to offer off- campus centers, to provide skill development courses and also to Foster other academic collaborative courses with the industry and foreign institutes. Overall this is a way so that they will be flexible and collaborative. Talking about the significance of these courses, we get to Know that The course of Artificial Intelligence, the machine learning course, etc. can now be easily launched by any University without getting the need for approval or without being delayed regulations and rules. And by this, efficiency will be ensured.

1. Ranking: The second step is providing ranking. One major challenge with the education system in India was that they didn't have a proper performance based public ranking system. So, the Universities and institutions were not ranked according to their performance and all in all basis. This gap is said to be filled after the Human Resources Department Ministry has launched the Atal Ranking of Institutions on innovation and achievements. So, this will be based on the innovative activities taken by the institutes and also on the various achievements made by the institutes. Under this by April 2019, more than 800 institutions were marked on several parameters. This system will bring an essence of competence among the higher institutes in the country. For instance those who let the students to launch startups, market ready projects, motivate them, will be highly rewarded than others (Schmidt et al., 2015) (Kamble et al., 2018).

2. Technical Education: The AICTE or the All India Council For Technical Education has reduced the minimum credits needed for degree from 180 – 160. So, this will effectively reduce the full semester academic load for the students as well as the faculty. Also, the AICTE has formulated the National Student Start Up policy. This policy will enable and foster interested students to take up courses with emerging technologies. Such type of initiatives will bring efficiency into the education sector. The interlinking and collaboration of all these pillars will result in a more connected partnership between education and industry .Such things will bring a modern outlook to the Industry(Iyer, 2018).

With the Advent of the fourth Industrial Revolution, it is imperative for a developing country like India to invest more in research and development sector and on the other hand it has to overcome the problems and issues of the structure of the education ecosystem. The policy makers need to plan an action in order to create a better model for higher education that will address the shift to Education 4.0 which is the need of the hour.

4. STUDENT'S PERSPECTIVE

Students are at a verge of change where a learner is at the center of futuristic ecosystem. With over 904 Universities and more than 47,000 colleges in India, which are merely seen as only 'degree producing factories' having the scope for minimal ideas and innovation as compared to global institutions. This again creates fear among students regarding their employability with such high competition. As a consequence, the education system must make a rapid shift according to the developing mindset. Also, due to this technological breakthrough, the work task performed by humans is making a shift to machines. A survey suggests that in 2018, an average of 71% task was performed by humans in industries which will be reduced to 58% by 2022.

This implies less number of jobs for students and more jobs will be taken over by machines. However a new set of jobs is likely to emerge which will require human skills and proper potential to handle these things, which again remarks the importance of Education 4.0. Evolution in such a case in any field will be done in years or say months rather than which took centuries.

5. CHANGE IN TEACHING PATTERN AND CURRICULUM

Most of the schools, colleges and universities in India still follow the same traditional way to illustrate on different subjects with the same old content. The purpose of bringing change is irrelevant if this system prevails.

The future of work should go hand in hand with a discussion on the future of curriculum and those who eventually deliver i.e Teachers or faculty.

There is a requirement of skills to be generated in students from basic problem solving, creativity thinking, and teamwork to some more specialized skills. But no attention is given to them in our persisting education system. All care about how high credit they can score which will help them in getting a good placement in future. Students need to be introduced to some professional courses in order to explore and develop such skills.

Modern learning requires modernizing delivery. Teachers should use and focus on more technological applications with their proper training and development in this. Student's curriculum must be based accordingly so that the teacher student interaction seems more engaging and interesting. A smart approach should be followed. This will provide greater flexibility to the students in choosing their choice of mode of engagement. Not only teacher and curriculum, but the entire education administration needs to shape in this manner. If not done, students will lose their shine in the future job market. As per the current scenario, a student's attitude and ability to perform is also seen with skills. That's why; Universities and institutions should acknowledge and develop the right strategy to achieve this. They should build a comprehensive and friendly framework.

India's reskilling challenge can only be met if the links of industry, students/job seekers and schools/ Universities work in tandem. Now some questions again are debatable and answered within common people like you and me. Starting with the most generous one that is If India is ready to accept this change? Will the running government will still dwell in it's past on issues like caste , Creed or religion or some legacy issues or will it focus on the upcoming trends and revolution? No doubt this will mark a new beginning in the human era but the facts and

consequences associated with it are too complex and hard that they could not be neglected .Again already there is an issue of illiteracy in India and here talking about taking higher education to another level may be somewhere contradictory. However still everyone has to move and shift according to the changes. The industrial Revolution 4.0 in education sector will bring the inception of a new era which will help everyone to look, learn and explore things with a completely different manner. It is high time to witness this change and make it a part of our life and this moving towards a more intellectual, knowledge driven and progressive futuristic world.

6. ASSESSMENT

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