EDUCATION 4.0: TRENDS AND CHALLENGES FOR THE 21ST CENTURY TEACHER

Dr. Dayal Pyari
Assistant Professor, Amity Institute of Education,
Amity University, Noida, Uttar Pradesh

Abstract

This paper aims at analysing the historical progression of Industry 4.0, leading to Education 4.0. It further aims at unpacking the trends and challenges related to Education 4.0 and presents certain suggestions for the teachers to adapt in their classrooms, to make them 21st Century ready for their learners.

Keywords: *Industry 4.0, Education 4.0, 21st Century, Teachers.*

Introduction

The nature of our society is dynamic. It is subject to changes, that too revolutionary ones. When it comes to industry, our society has not only undergone enormous changes but has also seen various accounts of the industrial revolutions. People all over the world have been witness to these revolutions, generation after generation. The industrial revolutions occurred in response to the changes that were brought up in the social setup of the society w.r.t needs, requirements, desires, inhibitions, expectations etc. With all these fast-paced changes, there is an ardent need to study the industry and analyse the reasons as well as consequences of such revolutions and their impact in our lives.

Industry 4.0

We live in the era of Industry 4.0, which refers to the intelligent networking of equipment and processes for industry using information and communication technologies. It is the digitalization of manufacturing/production and allied industries, as well as value generation activities.

There have been three previous industrial revolutions that have resulted in paradigm shifts in the manufacturing domain: mechanisation via water and steam power, mass production in assembly lines, and automation via information technology.

Industry 1.0 began in the 1780s with the advent of water and steam power, which aided mechanical production and vastly improved agriculture. Following that, Industry 2.0 is described as the time when mass production became the primary means of production in general. Steel mass production aided the introduction of railways into the industrial system, which in turn aided mass production in general. Industry 3.0 began throughout the twentieth century with the introduction of the Digital Revolution, which is more familiar than Industry 1.0 and 2.0 because most people today are familiar with

industries that rely on digital technologies in production. For many countries, the massive development in computers and information and communication technology industries was and continues to be a direct effect of Industry 3.0. Many vocations have changed as a result of Industry 4.0. People have always been required to acquire new daily chores, but they are now also required to use high-tech devices, which are rapidly becoming the most significant aspect in their professional lives.[1]

Industry 4.0 is defined as a transformation of the entire organisation, including the production process, through digitization and automation. Industry 4.0 will be accepted by large worldwide firms that apply continuous improvement concepts and have strong research and development standards, allowing them to become even more competitive in the market.

Industry 4.0 is used interchangeably with the fourth industrial revolution and represents a new stage in the organization and control of the industrial value chain.

Impact of Industry 4.0 on Education

One of the majorly affected areas by the industrial revolution is that of Education. Thus, it is significant to not only keep up with the industrial advancements, but also to analyse the impact of industry on the educational sector as a whole, involving all the stakeholders. When it comes to Industry 4.0, it does not only affect the business, governance and the people; it equally affects education. This is how the term Education 4.0 came to existence.

With the arrival of the 4th Industrial Revolution, education's function is shifting, and it is being relied upon to meet new demands. This leads to the emergence of Education 4.0, a phrase coined by academics to characterise the different ways in which technology is incorporated into the educational environment.

Education 4.0

Every individual must have the ability to know when and where to employ technology in the future. To fully benefit from Industry 4.0, they must be critical thinkers, problem solvers, innovators, and leaders. They must be prepared to face all of the problems that this transformation will bring. Overall, education has little choice but to adapt to the changes brought on by new technology, resulting in Education 4.0[2]

Education 4.0 is therefore a response to the needs of IR4.0 where human and technology are aligned to enable new possibilities. A disruptive system, Education 4.0 not only focuses on 'what is taught' but it also assumes a nuanced approach to 'the way it is taught'. It is an education model which is aligned with future trends, in order to develop and enhance individualised education that will eventually go on to define the manner in which youngsters of the future will work and live.

As the barriers between man, machine and technology dissolve, we need to define education for the next generation by keeping intact elements, values, beliefs and insights that make us 'human'. This is the essence of conceptualising Education 4.0.

Essentially, pupils must be trained rather than instructed. They must seize the information and resources that will be made available to them on their own. As a result, the need of the hour is for Industry 4.0 to be aligned with Education 4.0. The least that today's schools can do is provide a more flexible curriculum and structure, and teachers should act as mentors. The education industry will undergo a revolution that will make it more individualised, peer-to-peer, and ongoing.

Trends in Education 4.0

Education 4.0 is embedded with technological interventions such as smartphones, online evaluation and assessment; Artificial Intelligence and big data. The future of education has been transformed for the better, thanks to modern technologies and automation.

In some ways, Education 4.0 completes the phenomena of digital integration in our daily lives, where humans and machines work together to solve problems, troubleshoot, and, of course, uncover new theories of innovation. Information is everywhere in education 4.0, and the teaching and learning process has become dynamic. It is not difficult to imagine what education 4.0 will store for us as technology improvements progress. The future of education 4.0 has the potential to significantly alter the economic use of information. [3]

Higher education institutions are projected to play a big role in the use of technological breakthroughs in education 4.0. It can improve the effectiveness of the teaching and learning process by incorporating the latest technologies. Students would pay greater attention to studying and demand more as a result of new technologies.

There are nine trends related to Education 4.0 (Fisk, 2017) [4]

1. Learning can take place anytime anywhere: E-learning, remote learning, flipped classrooms etc.
2. Learning will be personalized to individual students: Positive reinforcements, boosting learners' confidence.
3. Students have a choice in determining how they want to learn: Blended learning, flipped classroom and BYOD (Bring Your Own Device) approach.
4. Students will be exposed to more project-based Learning: Improving their organizational, collaborative and time management skills.
5. Students will be exposed to more hands-on learning through field experience such as internships, mentoring projects and collaborative projects.

6. Students will be exposed to data interpretation in which they are required to apply their theoretical knowledge to numbers and use their reasoning skills to make inferences based on logic and trends from given sets of data.
7. Students will be assessed differently and the conventional platforms to assess students may become irrelevant or insufficient.
8. Students' opinion will be considered in designing and updating the curriculum. Students will become more independent in their own learning, thus forcing teachers to assume a new role as facilitators who will guide the students through their learning process.

Challenges in achieving Education 4.0

While the present and the future seem to be very promising for the education sector with IR 4.0 and Education 4.0, there are some challenges that need to be addressed. Teachers will have a substantially heavier task as a result of their usage of technology. The usage of technology has resulted in the emergence of a variety of distinct and demanding occupations. It worsens disparities and extends the socioeconomic divide. Job losses are a very real possibility. Simultaneously, it presents a slew of ethical concerns. It offers cyber bullying and hate speech enough airtime, making the world more confusing, insecure, and uncertain. Furthermore, technology undermines individuality and the private sphere of existence to a large extent, homogenizing people's opinions, and greatly polarises society. [5]

So, the challenges to achieving Education 4.0 are as follows:

- Access and Equity: Provision of disruptive technologies while ensuring mass social inclusion.
- Unemployment: It is predicted that at least 50% of jobs will be lost due to technologies.
- Funding and investment
- Awareness and motivation among educational institutions and teachers.
- Pedagogical strategies and approaches: Necessary shift needed
- Assessment and Evaluation: Overuse of conventional methods and lack of innovative ways of assessing learners

Conclusion

Artificial intelligence (AI), robots, the internet of things, autonomous vehicles, bio

and nano technology, 3-D printing, material science, quantum computing, and energy storage are examples of recent breakthroughs that the Indian education system must justify. Positive reinforcements must be transmitted across the country to schools and institutions. [9]

Understanding the necessary abilities for instructors in the twenty-first century, as well as teaching that is up to industry4.0 requirements, is a must. It is necessary to build the beginning of an era of learning-anytime-anywhere. The bigger the opportunities for e-learning tools, the better. Students will have more access to self-paced learning as a result of this. The idea of a flipped classroom needs to be spread. The flipped classroom method would make it easier for the classroom instructor to organise learning activities that would promote the students' social emotional learning. [6]

A teacher teaching in the 21st Century can adapt the following points in her classroom so as to envisage it in sync with Education 4.0:

- Meet the specific needs of students and facilitate personalized learning.
- Use a variety of tools and techniques that promote flexible and active learning so as to reach educational goals in a better way.
- Brainstorm the best technique and methods to facilitate the learners.
- Constructively use collaborative platforms so as to maximize collaboration and teamwork.
- Design innovative ways of evaluating the learners.

References

1. Tay, S., TeChuan, L., Aziati, A., Ahmad, A. N. A. (Dec 2018). An Overview of Industry 4.0: Definition, Components, and Government Initiatives. Journal of Advanced Research in Dynamical Control System. 10, 14.
2. Kumar, A., Anand, A., Kesri, V. (2020). Industry 4.0 to education 4.0: An Indian Student Perspective. International Journal of Innovative Research in Technology. 6(12), 7.
3. Halili, S.H. (2019). Technological Advancements in Education 4.0. The Online Journal of Distance Education and E-Learning. 7(1), 63-69.
4. Hussin, A., Aziz (July 2018). Education 4.0 Made Simple: Ideas For Teaching. International Journal of Education and Lit.Study. 6(3), 92.
5. Panagiotopoulos, G. (Jan 2020). Education 4.0 and Teachers: Challenges, Risks and Benefits. European Science Journal, 16(34). 108-122.
6. Tandon, D. R., Tandon, D.S., Nagar, M. Education 4.0: A New Paradigm in