

EDUCATION 4.0

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ABSTRACT

Education 4.0 is a revolutionary response to the 4IR (fourth industrial revolution). Education is a tool for societal development. Automation and digitalization of industry have given an edge to human potential, and to tap it, education 4.0 comes to the fore. Now, the objective of education is to explore the learning process to its fullest and create a constantly evolving learning community in place of a knowledge-based community. The whole education system, from objectives to evaluation, has changed drastically. The learning process has reached up to the meta-cognition level of the brain. Today's key factors of this process are re-inventing the objective, re-skilling & re-assessing the evaluation process, and achieving a new pinnacle and dimension of learning. Education 4.0 is aimed towards Generation-Z which has completely different aspirations and expectations. Soft skills also gain importance along with hard skills. Creativity, emotional intelligence, social interest skills are a must for the new and evolving professions of the future. The role of the teacher will be that of a facilitator and students will take the helm in his/her learning chariot.

Keywords: Education 4.0, 4IR, re-skilling, learning community

EDUCATION 4.0

Education is a social process, so it is always a focal point about the development of society. From ancient times, it is considered an important tool for social change. Any change in society brings a change in education. Education 4.0 is the buzzword today as recently we launched the National Educational Policy 2020 (NEP 2020) of India is reflecting the revolution in Education 4.0. Change is the only constant and it is the phenomenon behind the advancement of humankind. With the change in times and technological advancements, education has always moulded itself accordingly. Education 4.0 is that step of mankind which is ready to keep pace with industrial revolution 4 (4 IR)

HISTORY OF EDUCATION 4.0

Education 4.0 was developed in response to 4IR in which a marked increase is the use of internet-based technology and digitalization of tools and processes across industries. Shwab (2016) provides an example that aids in understanding how the industrial revolution has taken place across time. In I IR, water and steam were used to mechanize the production, in II IR electric power was used for mass production. During III IR, electronics and Information Technology were used to automate the production. The speed of evolution between III and IV the IR was beyond imagination. The advancement in IV IR was termed as ‘ Disruptive Technology’ as there was no instance for this in history. Artificial intelligence (AI), robotics, Big Data, Internet of Things (IoT), Bio and Nano Technology, Quantum computing, etc. maximized digitization and automation. We can convincingly say that even the developer of these, ie humans are left far behind. According to Dr. R. Natrajan, IVth IR gained traction when a German government memo released in 2013 used the term ‘Industry 4.0’. The memo outlined the plan to fully computerized manufacturing without the need for human intervention. The initial goals of Industries 4.0 were automation, improvement of manufacturing processes, and production optimization. IR 4 is not only disrupting and revolutionizing processes and business governance and people management, but it is also impacting education as well. It is now very clear that 4 IR has become necessary for the next generation to be abreast of highly advanced and fully automatic technologies. It is because two-thirds of the industries above 60% of digitalization and automation will result in the coming being of cyber-physical systems. Humans and technology will build a complete synergy with these systems to execute the tasks with precision and speed and explore new possibilities. It is for this that education 4.0 is like a Revolution 4.0.

Information and Computer technology of NEP 1986 brought forth education 2.0. Teachers and students, both began to utilize technology in a basic way. On the way to enter into the new millennium and because of globalization effects, there have been greater advancements in education. Along with this, education started getting affected by user-generated internet. This gave rise to Education 3.0. Now, nearly at the quarter of the new millennium, Education 4.0 emerged at the beckoning of technological advancements, aspirations, and needs of the industries. Formerly human aspiration was behind technological advancements, now, industrial and technological advancements are giving the edge to human potential and the

answer is only education 4.0. Now, education is not limited to the process between teacher and students neither it is tripolar (teacher, student, and content). In today's time and age, students have a variety of knowledge providing and processing sources, a more collaborated approach has taken place. Learning has become more personalized; universities have the objective to prepare their students for a world where cyber-physical systems are prevalent across all industries of the world. This has changed the education process in three ways-

1. Technology as a part of the curriculum
2. The changed approach towards learning
3. Improving the all-over experience of students

Research by McKinsey Digital reeled that due to IR 4, 60% of all occupations could potentially have atleast a third of their activities automated. This change aspires to bring potential disruptive change not only in hard skills but also in the soft skills of students.

In 2016, the World Economic Forum produced a report exploring these changes. They predicted that by 2020, 'more than one-third of the desired 4 skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today.

Due to advance technology, every state holder of the process will be constantly connected to the process, job roles are steadily becoming more adaptable, flexible, and accountable. Due to this, some soft skills will gain importance such as emotional intelligence, social skills, complex problem-solving skills, and processing skills.

WHAT IS EDUCATION 4.0?

The focal point of Education 4.0 is the evolution of the learning process of the students. It is not important here when and how the content is sourced. What is important here is how the student is processing that knowledge.

Also, is a pertinent question if the student can evolve to the highest capability of the mental domain involving creativity and meta-cognition. Mankind which has gone through extensive cognitive evolution in this materialistic world now seeks to learn pinnacles and dimensions. Along with hard skills, the development of soft skills is becoming necessary.

TRENDS OF EDUCATION 4.0

Fisk (2017) stated nine trends related to Education 4.0:

- I. Learning can take place anytime and at any place in a self-paced manner.
- II. Learning will be personalized to an individual student, with positive reinforcements to promote a positive learning experience and boost confidence in their capabilities.
- III. Learning outcomes would be pre-set but a student can choose learning tools and techniques. It will enable them to be creative in their learning.
- IV. A student would be exposed to more project-based learning so that they will apply knowledge and skills as well as practice their organizational, collaborative, and time-management skills.
- V. The emphasis would be on-field experience with internships, mentoring, and collaborative projects.
- VI. Technology will provide leverage to the cognitive domain thus through field experience, a student would get more time for other domains (affective and psychomotor), through interaction with technologies and other humans.
- VII. Due to the digitalization of a process, students did not need manual mathematical skills but they will be more exposed to datainterpretation. Here, they will need to apply theoretical knowledge to digits so that reasoning and logical skills will be needed.
- VIII. In Education 4.0, there will be a radical change in the evaluation process. The formative and constructive evaluation would be prevalent. Factual knowledge would be checked during the learning process while the application of knowledge can be tested during field and project works.
- IX. To make the curriculum relevant, feedback of the students would be considered by experts and designers of the curriculum.
- X. In the conventional system, a teacher is said to be a guide but in the new system, they are considered as the facilitator of the learning process as a catalyst. Students will be independent and responsible for their learning

CLASSROOMS OF EDUCATION 4.0

Due to the technological leap, there will be a huge change in the position and scenario of the classroom. Formerly, the classroom was the center of knowledge dissemination, teacher-student interaction content-student interaction. Now the process will be reversed. Knowledge of content interaction will take place outside the classroom virtually with different sources and then the student will come to the classroom for interaction with the teacher or simulation of the process. “Dunwill 2016 also predicted how an average classroom will look like in the next 5-7 years:

- a) A huge change in the layout of the classroom
- b) Virtual and augmented reality (VR AND AR) will change the educational landscape
- c) Flexible assignments will accommodate multiple learning styles
- d) MOOCs and other online learning options will impact secondary education”

A scenario of the classroom will not be in rows of students and platforms of teachers. There will be a different type of platform with flexible seating arrangements. An atmosphere of a classroom will be more friendly, positive, and constructive.

ROLE OF THE TEACHER AS A FACILITATOR/ ENABLER

Today’s teacher is interacting with Generation-Z whose learning preferences have changed due to using of ICT, this generation has become more aware of its needs, choices, and preferences. Technological advancements are also giving a challenge to the teacher to meet the learner’s needs and preferences. “Educational technology and mobile learning (2016) website suggested instructors to equip themselves with some fundamental digital skills such as creating visually engaging content, create engaging presentations, use blogs and wikis to create participatory spaces for students and curate and share resources with the class, etc.”

It appears that technology is playing the part of the teacher but it should not be accepted just like that. Now the teacher’s role is not limited to content transmission as it can be obtained from various sources. It is expected of the present generation of teachers to produce creative and unique engaging content through the use of digital mediums. Its presentation should be

such which can enhance learning and develop the social and emotional skills of the student. With the help of some apps, VR and AR can be integrated into the teaching-learning process

TODAY'S LEARNER AND EDUCATION 4.0

Today's student belongs to Generation-Z who is revolutionized by technology and directly involved in the learning process. Cozinski (2017) highlighted some learning preferences OF Gen-Z students. They are fully engaged in learning, welcome challenges, and real problems and learning sans boundaries, etc. They need digital tools and online forums.

Today, when the advent of artificial intelligence is because of IR-4, then AI poses a challenge before the learner also. If human intelligence and artificial intelligence have to work in synch, then human intelligence has to raise itself to its maximum access to tap its infinite capability.

Education 4.0 will have to view education from a new perspective. It should redefine the objectives, reinvent the strategies and methods, and re-skill the learners

SALIENT PARADIGM SHIFTS IN EDUCATION 4.0

1. Life-long learning instead of front-loaded learning
2. impact factor has phased out quality factor
3. re-invention of the process
4. phasing-out of supply-led education by demand-led education
5. competency-based instead of knowledge-based
6. re-skilling and incorporating disruptive technology in the teaching-learning process

EDUCATION 4.0 IN INDIA

Every process has its merits and demerits. Development is a fundamental process. The process of education is also evolving with the times. There is no doubt that education 4.0 is a key factor of development of Generation-Z in this global society regarding our country India, National Educational Policy 2020 has been launched in which several elements and trends of education 4.0 are visible. There has been a speedy development in education technological advancement and information and communication technology globalization, rich young human resource, and the present Indian foreign policy has generated interest in

various other countries to set up their industries in India. There is an acute requirement of a technically advanced, proficient, qualified, creative, and skilled workforce for the incorporation of IR-40 in all jobs and vocations. So, therefore we will also have to drastically change our education system, reset the objectives, and provide new perspectives to learning and potential enhancement.

Our country is diverse in all senses – ethnicity, religion, geophysical structure, language, knowledge, etc. education 4.0 should be implemented in India keeping these parameters in mind. Youth is our USP (unique selling point). They should be mentored through education 4.0 that they should fit completely in our industry framework. They should also be qualified enough to render their service anywhere on the globe. The broad principles of education 4.0 remaining as such, the fine-tuning of it should be done as far as the Indian youth is concerned

Unemployment in this country has always been a bane for society and the government. Education 4.0 should take this factor into account seriously when it is implemented. It is all right that humans have made such great technological advancements (AI, robotics, cybernetics, etc.) that now these advancements are starting to drive humankind to the background and it is becoming its slave. This should be avoided at all costs. If advancements curtail employability, then they should not be called advancement.

Indian culture has its ethos Satyam ShivamSundaram. It promotes respect and awe for the aesthetics. Technological and educational have very little concern about their aesthetics. This should be pondered upon in education 4.0 as it is most necessary for the overall development of the man, society, nation, and intern the whole world.

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