



**EduInspire** -  
**2026**

An International E-Journal

**ISSN 2349-**

An International Peer Reviewed and Referred Journal  
Council for Teacher Education Foundation, (CTEF, Gujarat Chapter)

[www.ctegujarat.org](http://www.ctegujarat.org)  
**ISSN 2349-7076**

# EduInspire

- An International Peer Reviewed and Referred Journal



**VOL: XII**

**ISSUE: I**

**JANUARY-**

**2025**

Council for Teacher Education Foundation,  
(CTEF, Gujarat Chapter)

## **Transforming Education to Cope With Fourth Industrial Revolution (4IR)**

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### **Introduction:**

The first industrial revolution started in 1780's when steam engine was produced, which enhanced the productivity of human beings. Later in 1870 the mass production and emergence of electrical energy led to second industrial revolution. The emergence of IT & electronics led to third industrial revolution, which enabled efficient production. Presently we are in third stage of fourth industrial revolution which focuses on digitalisation and automation. These changes are occurring because now human beings have finally developed the computing capacity which will help in storage of large amount of data, which in turn will help in machine learning. The important feature of the fourth Industrial revolution is technology. Internet has brought lots of revolution. Cloud computing, Artificial Intelligence, Big data analysis has revolutionised the business decisions and brought new innovations. IR

4.0 has entered in all spheres of our life like industry, agriculture, health sector etc. The fourth Industrial revolution has transformed our way of working, our organisations and even our day to day life. This revolution has entered even into our homes. The day to day lives are changed, everything has been digitalised. Who thought some years back that the vegetable vendors will be using technology for receiving payments? Life has changed very fast. We also find change in our young generation, the way they communicate, learn and play. Even the educational system cannot remain isolated from the impact of such industrial revolution. The education system needs to change so that it can prepare the future generation to face the challenges of fourth industrial revolution. We are the first generation people, experiencing this revolution. We find that every day the new models are becoming obsolete at a faster pace. It's being projected that ours will be

the last generation who is learning to drive cars. The future is of automation. Even now we find driverless cars (Tesla). In this fast changing scenario, it becomes imperative for a society to prepare its citizens for future generation needs.

This industrial revolution will transform industries to such an extent that most of the work that is existing today may not exist in the coming years and many such new jobs will emerge which we are not even aware of today. So it is very important for us to understand the impact of these changes at the earliest and prepare the people for such works. This has a strong implication for our educational institutions. Education under fourth industrial revolution needs to be full of innovations. “The fourth Industrial Revolution IR 4.0 will accelerate the rate of disruption in jobs which we are already experiencing, and it is necessary to empower individuals to take charge of their education and career strategies” (Reaves, 2019). This revolution will need individuals who have cognitive flexibility that will allow them to be prepared for lifelong learning. One needs to be always ready to learn new skills and be competent enough to cope with the continuous change taking place in fourth industrial revolution.

There is a need to design the programme and curricula that will match the future employment needs. Many of the jobs will get automated in the coming years and the new generation needs to be prepared for that changed society.

#### **4 IR and Challenges to Education system**

“World Economic Forum reports that IR 4.0 requires reshaping the future of education and work to diversify talents” (Yang, 2019). The students’ needs to be prepared for facing the challenges of this 4IR, they should be prepared to handle the digital applications and the automation in all spheres of life. Our education system should now start changing so that it can make the students ready for the mystic future. It’s difficult to predict the nature of future jobs and the new technologies which will come. There is a need to bridge the disciplinary divides between the different disciplines.

The knowledge and skills which we want in the future youth will definitely not be the same what we are preparing at present through our education system. As soon as the students presently undergoing education will move out in the outer world looking for employment, they will find that they were never prepared for those jobs. It is high time that we change our education

system and prepare the youth for the future society and help them to cope and sustain in the changing society. Now the question emerges that how do the educational system get them prepared for this. Education has to start responding to the needs of Fourth Industrial Revolution. There is a need to develop the individual capacities of the learners to become the self-learner so that they can cope with future demands and contribute in the innovations.

The present education is not equipped to develop the dynamic skills needed for the changing society. Most educational institutions are still giving the same age old education to young people who need futuristic skills in this 21st century.

*"Your education today is your economy tomorrow,"* says Andreas Schleicher (PISA) who has become one of the world's most influential figures in education. The emergence of technological advancement leads to need of new skills. To cope with the fourth industrial revolution we need the future students to be more creative, collaborative and critical thinkers. To build such students there is a need to change curriculum and create the required skills. Let us first accept the need for change and then start working towards it.

### **What needs to change in Education?**

**The Education needs to respond to 4<sup>th</sup> Industrial revolution. "The fourth Industrial revolution will bring substantial change in the learning opportunities, educational policies and even the strategies of instruction"** (Al Lily, Elayyan, Alhazmi & Alzahrani, 2018). The change needs to start from schools and universities. **There is an urgent need for teachers to evolve themselves so that they are competent to develop individual students potential and prepare students in becoming self-learners who in turn will innovate the world tomorrow. We can bring some changes in teacher, curriculum, and pedagogy to cope with the challenges of 4 IR.**

### **Changing Role of teacher**

The role of teacher will change in the 21<sup>st</sup> century. The teachers have to act as a facilitator than a teacher who delivers content. The present generation students already have various sources to gain knowledge. As students have lots of exposure in this technological era, the teachers needs to shift their role from being a teacher to being a facilitator. They should also update themselves and develop technological competence to support students. Teachers have to use technology

for making the teaching learning interesting and supportive. Various technological supports can be utilised for satisfying the curiosity of future students. Technology also gives an opportunity for students to collaborate at national level for various projects despite being not in physical proximity. The environment which can facilitate self-learning needs to be created by the teacher.

### **Shift in pedagogy and Assessment**

The teachers need to design their teaching strategies in such a way that it helps the students to identify their individual potentials. It's a great responsibility on the teacher to prepare the students with the skills which will be needed to shape the future through innovations supported by technology. To cater to the needs of fourth revolution the new teaching strategies needs to evolve. The new pedagogy which can focus on higher order of learning of Bloom's taxonomy has to be evolved. The students have to be prepared in such a way that they can apply their learning in the new situations. They should be trained to analyse new knowledge and develop skills needed for fourth industrial revolution. The students' needs to be empowered in such a way that they can think independently, resolve their own issues and decide their

future. With so much changes taking place around us, the educational institutions also have to change. There is a need to understand that students will not get inspired through the traditional way of teaching.

Teaching should be such which helps the students to move towards higher order of blooms taxonomy that is apply, analyse and create. The focus should not be to just enable students to perform functions as future workers but we need to empower them to think independently and design their own future in tomorrow's workplace. The pedagogy needs to be student centric which also takes care of individual differences. With the change in pedagogy, the change in assessment is also needed. Assessments should be based on performance and project based which will test the real learning and not rote memorisation.

### **Connect Education with Employability**

As discussed in earlier section, we need to prepare the present generation for the uncertain jobs of future. The future employment needs will be totally different. What we are preparing today may not be needed in future. When the students will come out they will not find the traditional jobs they were trained for. Today when

they are taking education, most of the jobs are not in existence. There is a need of collaboration between the educational institutions and industries so that they can work in sync. Institutions of higher education should collaborate with industries and come out with the new educational programmes as per the future needs. Together we can work towards preparing the future work force. The students need to be prepared for the future industries.

### **Update curriculum**

In the fourth industrial revolution, the physical and digital worlds are merged with the help of artificial intelligence. The routine and mundane activities are being done by the robots. So now the workers need not focus on the routine tasks but needs to pay attention more on managerial skills such as decision making, problem solving, communication etc. The workers have to work hand in hand with machines and hence they need to be qualified in using technologies. Be it any field everywhere there is a mix of both human and technology. For eg in education also robots are used for teaching in classroom, but it doesn't mean that teachers are not needed. The 21<sup>st</sup> century workers are expected to be lifelong learners and should have soft skills.

These components need to be integrated in the curriculum. The curriculum needs to be redesigned in connection with the industrial needs. It needs to be aligned with the industrial requirements. The students' needs to be prepared for the continuously evolving industries. The curriculum needs to focus on important skills of future which are discussed as follows:

**We need the future generation to be trained in the 21<sup>st</sup> century skills to cope with the industrial revolution. Creativity will be the most important skills the workers will need. With so many new products and new technologies coming up the future work force needs to be more creative to find out new ways of working. Apart from creativity the global citizenship skills, digital skills and emotional skills are important to cope with 4IR.**

### **Global citizenship skills:**

With the advent of globalisation and new technology, the world has become one nation. Now there are no barriers for labour force and employment. The entire world is open for employment opportunities. In such a scenario, it's the role of education to prepare its future generation for the global citizenship. The global citizen needs to have qualities such as cultural tolerance, equality, love, respect for people and living

environment, active participation in solving global problems. The global citizens should be equipped with the qualities and competencies which will help in meeting the needs of fourth industrial revolution. The education system should incorporate the content that will focus on building the awareness related to wider world.

### **Digital skills**

Digital Skills should be an important part of the higher education curriculum. To be relevant and cope with the 4IR challenges digital skills are most important. As every job of future will be technology oriented so to be more employable and relevant digital skills are necessary. To take advantage of the massive transformation in different fields, the future workforce needs to be digitally literate. Even the education is changing to a great extent. We are finding online education, digital universities being set up, various MOOC programmes coming up. Now the universities are making a percentage of MOOC courses compulsorily to be offered to students. If they are not digitally literate they will not be able to cope with this transformation.

### **Emotional skills**

**There is so much mechanisation going on that there is no place for emotions.**

**Human beings are busy with the machines and losing the human touch. We need to develop the emotional skills among the future learners so that they are competent to deal with the stress and fast life. Human beings in this 4 IR are more connected to the digital domains and virtual reality. It has brought a lot of change in the way of communication in our day to day life.**

### **Conclusion:**

**Education in the fourth industrial revolution has an important role to play as education is only means to create future workforce and meet the future industrial requirements. Education will provide manpower and skilled workforce for various sectors. Education sector should bring changes so that we can overcome the future challenges.**

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