

President Speaks

India's higher education landscape is poised for a significant upheaval. Traditional education, which we are accustomed to for the last fifty years or so, is fast becoming irrelevant and is being replaced by market driven Outcome Based Education (OBE) catering to the needs of the industries at large. Educational reforms have gained momentum with the adoption of National Education Policy 2020 (NEP). Traditional knowledge is fast losing momentum and skill based education is gaining grounds. Skills shall define the new paradigm of India's education scenario.

Engineering education scenario, which forms a lion's share of higher education in India, is characterized by VUCA (Volatile, uncertain, complex and ambiguous). The backbone of the country's economy are engineers. Although India contains 25% of all the global engineers, but sadly engineering education in India lags behind in research and innovation. Engineering education must transform itself and experience a paradigm shift to student centric teaching learning process from a teacher centric one, outcome based education from content based education, knowledge sharing classrooms from knowledge seeking ones, facilitators rather than teachers, interdisciplinary courses from traditional engineering, technology driven learning from lecture based (chalk and board) learning and the list goes on and on.

Engineers with their innovative approach and an extensive pool of expertise are not mere spectators but propel the world by making a significant global impact and driving real change. An adept blend of curiosity, creativity and critical thinking to prepare for the unknown future is what engineers need. Quality of life can be continuously advanced by engineers. The engineering discipline is poised to transform ideas into reality. But successful implementation requires transition into emerging and contemporary skill based education fuelled by digital and technological developments and this may change the face of the education ecosystem in the future.

So, how do we really achieve this monumental feat of transforming our age old traditional engineering education infrastructure to an advanced, futuristic, innovative, robust and market oriented skill driven one?

Here are some thoughts:

Today's world and market is a digital and data driven one. There is no doubt that there has been a digital explosion in the country and to harness the ingenuity of this boom, scores of skilled engineers are required to maintain the same, let alone the question of expansion. This calls for a total overhauling of our present system of imparting engineering education



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and move exponentially to a robust structure propelled by skill based education and experiential learning.

We need to bring simulations and gamifications in our education pedagogy to catalyse skill based learning. Gamification is basically the idea of bringing in gaming and interactive features in education and educational applications. Gamifications and simulations are aimed at making learning fun and easy and most suited for imparting practical skills to students, especially engineering students. To translate engineering education to meet the needs of the industry and the present day society, such novel ventures like gamifications and simulations hold the key to success.

The world is changing rapidly and expect quality solutions at lightning speed. Solutions are fast transitioning from product based ones of yester years to technology based ones almost entirely. To harness and successfully implement technology based solutions what is required is ardent exposure to design thinking that teaches out of the box ideas to cater to the most innovative solutions in the least amount of time. Our engineering education should be steered in that direction to keep in alignment with current and future market trends. Again, skill is the key.

While it is true for every stream of education, the approach to learning is undergoing a sea change and engineering education is no exception. The pattern of learning is undergoing an evolution in becoming more and more outcome based and experiential. One such method is project based learning, mostly tech based ones, particularly applicable to engineering education, whereby students are being attached to a current ongoing project and by closely observing the outcomes of the project and the processes thereof, experiential learning is enhanced.

Empowering as well as engaging young people beyond classes and strata and addressing the existing disparities in the education sector is the thinking behind Education 4.0 which is beginning to be adopted in India as well. It is a clarion call to all stakeholders of the education ecosystem and the ed-tech sector to join hands and collaborate to transform the education system. Engineering education and the manner in which engineering courses are planned and conducted are going to be impacted hugely by the Education 4.0 concept.

So, Engineering education as a segment is poised for a big change in the coming years to come. Definitely the changes shall influence the way of designing courses in engineering. The moot idea is to make education absolutely compatible to market demands.

Inspite of the demand for engineers in the market, it is apparent that there exists a “skill gap” between what the graduates know and what the market demands in the new age scenario especially in the post Covid era. This “skill gap”, needless to say, presents a huge challenge to the engineering education system, the aspiring engineers and also to the engineering industry.

While it is true that the expanse and curriculum of engineering education has somewhat transitioned from the traditional approach encompassing emerging technologies like robotics, data analytics, artificial intelligence, sustainable energy etc., what is presently required is evolution of a skill-set from engineering graduates with a judicious mix of adaptability, critical

thinking and technical expertise. Unfortunately, very few engineering programs currently keep pace with the requirements.

But, there is a positive trend too. Lately many industrial houses have set up collaborations with some of the leading engineering institutions in establishing Centres of Excellence (COE) in the institution premises. They are aimed at imparting skill based industrial knowledge additional to the curriculum to enhance the overall learning curve.

Apart from technical acumen which is a must for engineering education, the cultivation of soft skills like communication, teamwork, leadership which have traditionally taken a back seat in traditional engineering education needs to be brought in to equip graduates with the interpersonal skills and finesse to seamlessly gel with a collaborative working environment.

Engineering institutions also need to instill a culture of lifelong learning to suitably address the skill gap as the core of engineering education lies in constant evolution and innovation.

Therefore, to conclude, engineering education today needs to find out ways and means to address the skills gap and this is an urgent and essential goal. This needs a multifaceted approach of promoting lifelong learning, nurturing soft skills, embracing inclusion and diversity and prioritizing experiential learning. And, this is what our engineering institutes should aim at. The result shall unfurl engineers of a new generation equipped with T-shaped skills, all round abilities, practical experience and a deep love and allegiance for innovation, to serve the market, industry and society and be tuned with their ever changing demands.

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