

Engineering education needs serious rethinking

There is a perceptible disconnect between the students, faculty and managements of engineering colleges

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For nearly two decades now, the Indian tech industry's unique selling proposition (USP) has been that India, with its vast infrastructure of engineering colleges, can supply the world with well-trained, best-in-class software workers and engineers.

But most industry veterans know that these claims are a stretch. Engineering principles learned in college are rarely applied in the world of software or product development. Freshly minted graduates are not really career-ready to take on the task of developing and maintaining the world's computer systems, or build the next-generation killer engineering product.

The root causes of these ills stem from a diverse set of conflicting visions and goals of the key stakeholders. Managements of private engineering institutions, parents, faculty, students, employers and even government are all in the game for vastly different reasons unrelated to the USP.

Parental pressures

At a recent conference in Hyderabad on transforming engineering education, international educators

asked over 1,000 students about pursuing engineering as a career. The faculty and management of the hosting institution were not permitted to attend: this was by design, as the experts wanted a true heart-to-heart exchange with our nation's youth.

The animated session brought out truths that are rarely told in public. The majority of students confessed that they never wanted to pursue engineering but did so because of parental pressure. Nearly all confessed that they are constantly distracted by smartphones and the pressures of having a social life. While these comments are anecdotal, it is hard not to conclude that similar student sentiments exist at other institutions.

The international team then spent time talking with faculty (without management teams in attendance). The takeaways here were not surprising. Professors had few clues about the vision of their managements; most confessed to not having the rapidly-changing technology skills to impart them to students, so they resigned themselves to teaching books to an exam.

Management teams seemed to be living in an alternate universe. The owners of these sprawling universities, many of them politically



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well-connected and drawing strength from their business legacies, often have little experience in the field of engineering education. They complained about excessive regulation from government and accreditation bodies. The motive to increase revenues and improve branding is paramount, and building impressive campus infrastructure to attract students is a common approach.

They use all the right words on stage and in conversation — sustainable development, eco-engineering, innovation and incubation

cells — but generally have little to show in terms of student or teaching outcomes.

Employers are flummoxed by this disoriented state of affairs and regard most engineering graduates as unemployable, unless re-trained in basic job and technical skills. Middle and lower-tiered students are unable to find gainful employment in engineering and step down to other professions. In a cruel irony, many of them go on to become teaching faculty at engineering colleges.

The US experience

Developments in the US may provide some clues about how to solve this conundrum, at least in the software industry. In a rapidly changing technology environment where today's youth may have to change career paths at least three times, a static engineering degree may be of little value. The focus perhaps should be more on imparting real industry skills rather than waste four years in teaching subjects that are quickly forgotten or are of little practical consequence.

In an earth-shattering piece in the *Wall Street Journal* last August, Kelsey Gee reported that GitHub, acquired by Microsoft Corp, hasn't required college degrees for most po-

sitions in years. At chip maker Intel Corp, degrees are optional for many "experienced hire" positions and coding boot camps are considered adequate training.

Even executives in India have come to acknowledge these developments.

Most mundane technology jobs — such as software testing and desktop support — are already heavily automated. Modern coding platforms are a lot more developer-friendly. The world does not need as many human engineers as in the past. It is little wonder that fresher starting salaries have stayed constant for nearly 10 years, although the rupee has substantially depreciated against the dollar.

Finally, there's the inspiration of the IT industry's charismatic leaders. Steve Jobs, Michael Dell, Mark Zuckerberg, Bill Gates, Paul Allen, Larry Ellison, David Karp (Tumblr) and Jack Dorsey (Twitter) all earned no college degree, far less an engineering degree.

These rapid changes ought to send shock waves through the nation's engineering colleges which must seriously rethink their mission or risk becoming obsolete.

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