

THE MOOC POINT

Massive open online courses could radically change higher technical education.

Even a casual observer of Indian higher technical education would notice that we face two grave challenges. Our 3,300-plus engineering colleges produce 1.2 million-plus graduates each year but not even a small fraction of the required qualified teachers. And, the significant investment by the government in new IITs and NITs, whose mandates extends beyond teaching to research, has a slow take-off, primarily because of the sluggish growth of the research ecosystem. Interestingly, used innovatively, MOOCs (massive open online courses) could significantly help address these seemingly disparate challenges.



MOOCs are a “revolution” in scaling quality instruction as they enable a “star” teacher to reach out to a large number of learners at different locations and with varying paces of learning. They consist of a set of short-duration videos that illustrate one or more concepts, which, when “learnt” sequentially, constitute a course. To complete the two-way interaction essential for learning, each course has a discussion forum which is moderated by the instructor and/ or by a group of teaching assistants. Assessment is the third major component of typical classroom learning. MOOC platforms are supported by a set of automated assessment tools that enable one to handle massive enrolment. In its most prevalent form, MOOCs are not real-time — recording is done offline and then made accessible to students — though efforts are on to provide near real time options. To give the course structure, material is released on a weekly schedule and assessments are synchronised to ensure continuous learning.

MOOCs are still not a substitute for classroom learning if there are enough qualified teachers. In fact, in many prestigious institutions, MOOCs are being used in “flip” mode: students listen to video lectures as “homework” and class time is interactive and used for problem-solving. Clearly, in the Indian context, this experimentation is a luxury that only a few elite institutions can afford. But MOOCs form a platform that helps quality instruction reach a large number of geographically distributed students at low costs. The asynchronous nature of instruction accommodates considerable “classroom” heterogeneity that arises from unequal background exposure, differing speeds of analysis and absorption as well as varying time periods for which students can sustain concentration. The ability to rewind and replay as well as pause to refer to the background material are game-changers. Further, short 12- to 15-minute videos, typical for MOOCs, are a real boon. A scalable and instant online assessment mechanism could enhance the effectiveness of self-assessment. This, supplemented with peer-learning in discussion forums, could significantly impact learning outcomes.

Now, consider the large technical universities, like Uttar Pradesh Technical University (UPTU), which have hundreds of affiliated engineering colleges with a unified curriculum and academic calendar. We, from autonomous institutions, always looked down on this system as a stumbling block to the growth of quality education. But today, they have the financial muscle to hire the best instructors to provide quality education through MOOCs. Consider the economics: a typical undergraduate programme consists of around 10 courses offered over two semesters, with an enrolment of 25,000-plus in each course. With an annual average tuition fee of around Rs 1,00,000 per student, even 1 per cent of this amount for a course would mean Rs 2.5 crore for a single MOOC. I can easily visualise a top MIT professor wanting to offer a course at UPTU! The technology is available; only the will is needed. Such a change could create a new era of “star” teachers — MOOCs are to teachers what film reels are to actors and TV to sports stars and yoga teachers. Note: the real innovation is to mainstream MOOCs so that tuition fees can be tapped to attract talent. This has still not happened in the US, where MOOC platforms are struggling because they don’t have access to tuition-fee dollars.

The ministry of human resource development has been setting up a large number of IITs and other teaching-and-research institutions. Their geographical spread is based on the expectation that they will act as catalysts for the development of their regions. But in the absence of a vibrant research ecosystem, the growth of newly recruited young faculty is severely hampered. MOOC platforms provide a unique opportunity to aggregate geographically dispersed students and offer research-level courses. The infrastructure — the National Knowledge Network — has already been created and only policy support is required for permitting cross-registration for pre-PhD courses and assessment by remote instructors. This could promote an unprecedented new wave of research collaboration among Indian institutions.

Money has always been a bad word in education: the best talent should go to teaching because it is a “noble” profession. This contradiction is even more obvious today, when the average pay package of a graduate is a key determinant of institutional preference. But not long ago, money was a bad word in sports, too. By mainstreaming MOOCs, we could change technical education. Of course, mindsets have to change — a vice chancellor earning Rs 80,000 as her basic salary will have to award a contract of Rs 2.5 crore to the Sachin Tendulkar of teaching data structures.

- By Prof. M Balakrishnan

IIT Delhi.