

ENGINEERING SELF ESTEEM

Relevant for: Health, Education & Human Resources | Topic: Education and related issues

Realme 2 or Redmi 6 Pro? Know which smartphone you should buy

One of the greatest contributions of the IITs and IISc to society are the NPTEL (National Programme on Technology Enhanced Learning) courses in engineering and sciences. We can proudly say that the NPTEL is one of its kind in the world. The Ministry of Human Resource Development, which funded this initiative, has made these courses available free of cost to the public. NPTEL courses are an important part of India's Massive Open Online Courses, SWAYAM.

NPTEL is used extensively by the best students in top engineering colleges. Forum discussions explain how many students obtained very good GATE ranks using NPTEL courses, without any other help. In a recent interview for the prestigious Prime Minister's PhD Fellowship that carries a Rs 70,000 per month stipend, we found one applicant from National Institute of Technology (NIT) Srinagar to be the best in all of the panels. We asked her how she became that good, although she studied at NIT Srinagar, which possibly does not have the best educational environment. Her answer was that she self-learnt the subjects through NPTEL.

Self learning raises self esteem, which helps the learners do well further in life. Is it possible to get engineering colleges and coaching classes to adopt NPTEL in a big way and make them available to many more students? After being an NPTEL coordinator and transmitting more than 5,000 hours of IIT Bombay's live lectures, I asked myself the following question: Is it necessary to have expensive studios, cameras, cameramen, etc., to produce useful educational content? The answer is no, and we established this through spoken tutorials.

A spoken tutorial is a 10-minute long audio-video tutorial, created through screen capture, with a running commentary. A script, approved by a beginner as understandable, is used to create the material.

A "novice check" of the script makes spoken tutorials many times more difficult to create than other methods of producing study material. If an ordinary tutorial is watched by 10 people, a tutorial made 10 times better will be watched by 10,000 people, and as a result, the additional effort is well worth the trouble. The target audience for spoken tutorials is a girl in a remote village, who gets time to study only at night. As she cannot contact anyone for help at that time, the learning material should be suitable for self learning.

We assessed the accomplishment of non-IT/Computer Science (CS) engineering students in Hyderabad, who studied one week's portion of Java programming through spoken tutorials. They did as well as students who studied the same material through lectures, delivered by the best teachers of the same college. More interestingly, the former had higher self esteem because they studied this material by themselves.

To improve the accessibility, we dub the audio of spoken tutorials into all 22 of our languages. Spoken tutorials can also be used offline. We have trained more than 40 lakh students through spoken tutorials during the past four years. More than 100 universities and their affiliated colleges officially use spoken tutorials.

One does not need studios, high-end video cameras and a cameraman to create spoken tutorials. One does not even need high-end computers. As a matter of fact, a low cost (Rs

10,000) laptop that we are promoting is sufficient. Spoken tutorials, funded by the HRD ministry, can raise the self esteem of its users and also its creators.

We now move on to the main problem facing the student community, which is the lack of jobs. There are questions whether we are producing too many engineers. I strongly believe that the lack of quality is the main culprit and not the number of engineers. In a recent study undertaken to test the programming capability of students, it was found that 95 per cent of them could not produce a working code. This test was administered on 36,000 IT/CS students from about 500 engineering colleges. Naturally, it will be impossible for these students to get jobs.

Is the converse true? That is, if they know programming, will they get a job? The answer is an unqualified yes. We recently paid \$25 per hour to young Drupal developers to develop a web portal for a government project. That is a lot more than what faculty members earn. This high cost is because of the shortage of skilled programmers. Such high costs make project execution in India an expensive affair. If the development costs can be brought down, many more such projects can be undertaken, both for domestic and export needs, thereby increasing the number of jobs.

To address such issues, a countrywide Hackathon (programming competition) has been initiated by the All India Council for Technical Education (AICTE). About 50,000 students participated in 2017, producing about 50 useful solutions. These numbers have doubled in 2018. This is an excellent way to stress the importance of programming to our students, many of whom seem to consider it an exercise in memorisation.

The ability to program and produce a working code immensely helps improve the self esteem of our students, over and above the benefits explained earlier. It will be interesting if we can come up with a business proposition for the highly-efficient coaching classes to get involved in this training. The newly formed National Testing Agency could also help assess the programming capability of students.

This brings us to the Joint Entrance Exam (JEE), the entrance exam used to select students to IITs. Unlike the approaches mentioned earlier, the JEE destroys the self esteem of a lot of students, who would have worked very hard for several years, but do not get selected. A degree from an IIT is not required to do well in life, with N Chandrasekaran of Tata Sons and Satya Nadella of [Microsoft](#) being classic examples. But who can get this message across to the 16-year-old aspirant and her parents? Based on the discussion I have had with children of many of my friends, I can say that it will take a long time to get over this trauma, the main reason being that it is caused at an impressionable age. I know this because I still can't completely get over the taunts I received from my classmates 40 years ago, as I was unable to speak English well when I joined IIT Madras for a BTech degree.

Finally, a brief word about coaching classes, because I have mentioned them in many places. Coaching classes are not the problem, but a symptom of the problem we have in our educational system. We need to find a holistic approach to arrive at a good solution to our problems.

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