



SCRIPT OF TALK

TITLE: **NPTEL Online Certification**

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NARRATION:

I would like to begin by thanking Prof T.V. Prabhakar for giving NPTEL this opportunity to describe their recent effort on online courses and certification. I believe this is part of a course on moocs and we're happy to be part of it. Let me first begin my presentation by describing the major players involved in this NPTEL online courses and certification. Of course this is a project of NPTEL. It's funded by the MHRD under the NMEICT program but we also have two partners, one is Google which partnered with us to provide the portal and NASSCOM which partnered with us in the certification process. So, this is an ongoing effort we have had one round of online courses and certification and we're going to expand going forward we have two courses going on right now as I speak and maybe more courses in January so NPTEL has been around for a long time now. The portal nptel.ac.in in that portal there are lot of courses basically lectures of classes at IITs and IISc that have been recorded and put up in a repository format. So, students who are interested in learning about engineering basic engineering mostly and even some advance graduate courses can log into the portal. There is no registration or anything that's required all the videos and content are available and students can learn at their own pace. So, that's an exact course from university that's offered on the portal and it's been around for a long time now nearly are more than for fourteen years are these recordings are available and we have nearly 700 courses fitting the entire engineering curriculum. So, this is nptel.ac.in and these are courses available for everybody. There's always been this requirement in India particularly for skilled employees. Skilled employees for mostly IT services engineering services and these are basic requirement is for BE's. After Bachelor of Engineering course they will join the workforce and contribute the IT services and engineering services and the numbers are very big and the number of hires every year is in 200,000 range and one problem it's been to get good graduates who can be employed in these companies and how to train them well during their college and the main skill required when you join a job are mostly problem solving

analytical thinking programming beyond the domain knowledge. So, if you take for instance electric engineering you should know you circuits all that but you should also have the analytical and problem-solving approach. So, this was a requirement from the industry side and MHRD has been trying to solve this problem using various methods and one method that NPTEL has embarked on recently is this online courses and certification so how exactly do we want to do it let me move on to the next slide here. So, if you look at the current scenario you have graduate from college and India produces a huge number of graduates from engineering college and the numbers is growing every year and it's in the millions. Now if you go from there to the number of graduates who are entering industry that fraction is very small and number of people who get hired is very very small and there are lots of reasons for it. Let's not get into the reasons for that but one of our goals is to increase that number. How do you increase the number of students would be employable and the next phase of the problem is equally interesting. So, once they enter the industry that is an extensive in-house training that happens. It's that can run from anywhere from six months to even a couple years in some cases and after that training the graduates really become really start working in projects and start contributing to the company so the goal also is to see if we can decrease the training time. How to increase the number of people who are entering the industry workforce and how to decrease the training time ones they join the industry. So, both these goals could be solved very nicely using online courses and moocs maybe particular. So, that's why we embarked on this idea so our philosophy has always been to create course packages that are useful for companies that are useful for students to get hired in the company so that's the overall philosophy not just to be an academic training exercise but focus towards employability. Let's see the gender set-ups. So, for this we have created this portal which is onlinecourses.nptel.ac.in tailored if the doc him and this portal of course is powered by Google a google has contributed in a big way both in the development and the maintenance of the portal so this is like most mooc portal. You would have lectures in video form that students can access at any time and once the courses are released there is a deadline for assignments. Assignments are released every week and the deadline comes at the end of the week and people have to submit the assignment. There is a very active discussion forum that students participate and the assessment are online as far as

the course is concerned and one addition to the portal which you probably won't find in many other portals is these online programming assignment which are unlike programming contest. So, if your course is on programming which is a pretty big component of employability. I mean if you want to be employable today you better know programming. So, if your course is on programming then many of your assignments may be online programming assignment. So, you have to sit down in front of a machine write a program submit it and get it clear. So, we don't stop with the course alone. So, that's the courses part of it the online course part of it were the students are allowed to submit assignments everything based on a core. There is no checking people just submit the assignment there is no more checking of whether they are doing the assignment or somebody else did the assignment for them nothing like that. So, it is just on a core-based assessment submission now to have a certification process that is meaningful in a country like India for instance you need to have in person certified proctored exams so it cannot be honored based purely then the certificate loses its value. So, what we're planning to do after every course which is relevant for employability is to also have a certification exam. so in that exam is going to be in person proctored students have to show up in test centre's write the exam it's going to be computer-based and then earn a certificate and the certificate will come from the IIT's which is running the course. So, for instance if IIT-Kanpur is running a course their continuing education program will issue the certificate. When IIT-Madras is running the course their continuing education program will issue the certificate. So, that's the plan that's we have set up the whole thing and one more interesting thing about the certification exam is if your course is a programming course then you have the option of having the certificate being like a programming contest not just multiple choice questions but programming questions the students are given a programming problem they have to solve it in some time and then they have to submit the answer. So, in three hours they would submit four or five programming problem. So, it's an interesting experiment and doing certification based on actual coding and not just multiple choice questions. Okay so, this is the setup that we have and NPTEL is supporting this and I want to make a few more statements. I think I had discussed most of this in the previous slide let me add a few more to this. Like I said the portal itself is quite standard it has all the elements moocs and something new is the Auto-graded

programming assignments a based on Mooshak instance. It's just a sister programming contest and for the management of the course. So, of course the running of the courses by our faculty the subject matter expert so this will be from NPTEL partner institution may be the IIT's or the IISC or any other partner and of course we have an army of TAs who support the faculty to participate in the discussion forum answer questions extra. So it's a big exercise I think people who run moocs will know it takes a village to run a mooc. As they say so it takes a lot of effort people. Have to pull in the resources and do it so the administration's support for certification for these courses will be provided by NPTEL. So, NPTEL will hire the test administrator collect the money from the students register them for the exam issue the hall tickets all those processes are taken care of by NPTEL.

So, the faculty the main thing they have to do along with the TAs is to run the course makes sure that the mooc runs on time and everything works well. So, that support the course management and let me now tell you about one particular course the first course that we did as a pilot so this was a course on programming data structures and algorithms. It started in February and ended sometime in June and the certification exam they were originally planning to have it in June but we ended up wrapping it up in August took some delay in the certification. So the whole thing was done exactly like a like it is describe the first have a mooc on a particular subject and then we have a certification exam to make sure that students earn their certificate for this course. Then the course is on programming data structures and algorithms and our industrial partner was NASSCOM and in fact the syllabus itself was framed with NASSCOM and IT industry participation. So, as you can imagine this these three subjects are the core of computer science and this is needed by NASSCOM an IT services industry in a big way so people who know the subjects can be readily higher so we created the syllabus in consultation with them and the course was pretty big hit. There were some 50,000 students who are register for the course. Of course that in most moocs the students are not all of them are equally interested. Not all of them have the time throughout the 8 or 10 week period for which the course runs so there are dropout's and that's to be expected and if you want some data here is the plot of what really happened. So, like I said 50,000 students registered but only fifteen thousand submitted the assignment for the first week. So really 15,000 is the serious

number and till about six seven weeks. We had some 7,000 students being interested in submitting assignments continue submitting assignments after about 5-6 weeks. The number kept on dropping but till the end there were about 3,000-4000 submissions for assignments which is pretty good. I think given that 15,000 to 3000 is not that bad drop for a mooc. So, this kind of analytics one can obtain and more fine-grained data can be obtained. Though, so I can give more details if I had time. For want of time I am not going into too many details here. So, the upshot is we were not immune to this phenomenon of dropouts. It was there but it was not very drastic 3000 out 15,000 is pretty decent at the end. So, at the end we conclude with a summary slide so that's an example of a certificate that we gave out for people who graduated. There was thousand hundred and fifty students who received the certificates which is the reasonably big number given that be held the exams for the first time and only intensities so it's a pretty big number given that. So now in September to December 2014 we are running two mooc course one this programming in C which is run by IIT-Kanpur the other is Electrical Circuit which is run by IIT-Madras. So, these two courses are going on right now as we speak so they will have certification exams in December and this time we are going to have 100 centre's for the exam so hopefully we will have more students being certified in these two areas which once again fundamental and important for hiring in industry. And in the January to April time frame and for next year we are thinking of offering five more courses and some popular subjects have been lined up so announcement will go off sometime soon. So hopefully this portal will continue and will have an interesting experiment and online courses followed by a certification which is valuable for a lot of people.

Thank you