



Eminent Scholar Lecture Series

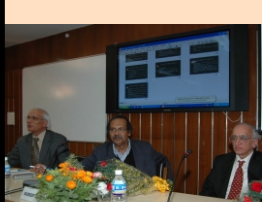
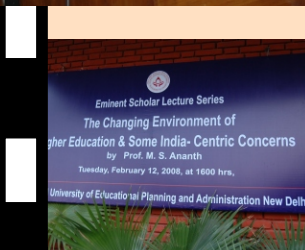
The Changing Environment of Higher Education and Some India-Centric Concerns



Prof. M. S. Ananth

Director

Indian Institute of Technology, Madras

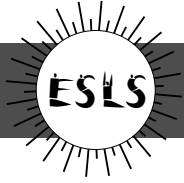


Transcription by
Dr. Veera Gupta



National University of Educational Planning and Administration
17-B, Sri Aurobindo Marg, New Delhi-110016
Website: www.nuepa.org

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Welcome Address

Prof. Ved Prakash
Vice Chancellor

The average of the developed nations is as high as 53 percent we are still struggling with 10 percent of access in higher education.

Prof. Ananth has been rewarded with a number of illustrious awards. The most prominent one's are Herdillia prize for excellence in basic research in chemical engineering and R.W. Fahien Alumni Award for the year 2003. He has been a Fellow of the Indian Institute of Chemical Engineers as also the Indian

National Academy of Engineering. Today Prof. Ananth in his talk would enlighten us about the 'Changing Environment of Higher Education with Some India-Centric Concerns'. We think would be benefited by his address. But before I invite Prof. Ananth to deliver his address I would like to make only two observations. One is that education in general and higher education in particular play key roles in the realization of India's extraordinary potential and aspirations for both social and economic development. And precisely because of it, there is an extraordinary demand for higher education amongst India's youth but we all know it for sure that higher education in India suffers from a number of systematic deficiencies. And if we wish to divide the problems or categorize the problems of higher education of India under three broad categories, then we can say that the institutions of higher learning in our country are suffering from three major crises. Number one is the crisis of identity and number two is the crisis of governance and third is the crisis of resources.

Among these the crisis of identity is far more challenging for us than any of other two. We can mobilize resources, we can impress upon the system to give greater resources for the development of higher education, but the crisis of identity is something which is shaking us the most and more so when we are competing in an era of globalization. We have problems relating to access. I mean while the world average is 27 percent and the average of the developed nations is as high as 53 percent we are still struggling with 10 percent of access ratio in higher education. We have problems pertaining to equity with regard to different social groups. We also have problems relating to relevance, relating to quality, relating to privatization, internationalization, and globalization of higher education and then relating to affiliating system. You would never ever find such kind of a system which we have inherited from the colonial system. Though they had given up affiliating system soon after 1858, but we are still continuing with that system. We also have several problems relating to governance and regulations and problems relating to research. Another problem is the problem of ensuring vertical linkages of school sectors and the higher education sector. Without making appropriate policy interventions at the school stage, it would not be possible for us to increase access to higher education. These are some of the issues which have been bothering us and I am certain that Prof. Ananth is going to reflect on all these issues. Now I would not like to stand between him and you, so straight away I invite Prof. Ananth to deliver his address. So, over to Prof. Ananth. Thank you very much.

The institutions of higher learning in our country are suffering from three major crises: crisis of identity, governance and resources.

The Changing Environment of Higher Education and Some India-Centric Concerns

Prof. M.S. Ananth

I am afraid that I am not going to satisfy Prof. Ved Prakash in terms of answering the questions that he raised. I have a different set of questions that I will discuss. I am first going to talk about the university, just the basic concepts of the university. And then I want to talk about some of the things which have changed the environment especially, in the last thirty years and how they might affect us. We have to respond to these environmental changes. How do we respond to them? The classical method of the western universities is to develop a strategic plan. We also did this in IIT Madras. So I want to talk about it a little bit how we approached the problem. After having developed the



strategic plan we discovered, I in fact wrote the strategic plan for IIT Madras after all the workshops were conducted by consultants and as well as by our then Dy. Director . I wrote the document, and reflective views and aspirations were collected. After doing all that, having been the author of the document I felt as if I was an outsider. I was not involved in it. I realized that my heart was not quite at it; my head was involved in it. I had learnt the method of approaching these problems from the western point of view. Then it struck me that there are some intrinsic India centric concerns. I spoke about them in many corridors; in fact I have had several conversations with Shri Sudeep Banerjee, who used to be Secretary when I was Director. In fact I don't think we spoke about IIT Madras in particular. I spoke mostly philosophy with him. And I would recommend that as a method for getting secretaries to help you, if you talk philosophy to them then when you send a paper to them it gets signed immediately. Let me get back to the topic of what I am going to do and share some of those concerns. I don't have solutions. Being a teacher, I have to talk to you about teaching itself and which is not synonymous to learn. If you teach and your students automatically learn, then there would not be any problem at all. Very often you teach and they don't learn or they learn despite you, so both happen. These are the issues that I would like to talk about. There are the modern theories of learning and creativity. I would like to show you some cultural aspects that are peculiar to the Indian context, which I think are not sufficiently reflected. I talk to many colleagues and they agree with me totally. But still we don't have a method of incorporating these into the education system. I will start first with pointing out that universities are the most traditional institutions. I will later say a few words about history of education in India. But yet although the universities are very traditional, they are the instrument for major change. If you look at the book 'The *scent of Man*' its Bronski, you see that all the big changes that have occurred in the civilizations have occurred in the university context. We have lot of changes in the environment and we have to respond to these changes in the environment. The President of Colombia University said,

I quote, “We should not seek to redesign a successful university but rather initiate changes that enhance what is good and vital and create what is necessary to flourish in a future, less friendly to higher education”. By less friendly he means less friendly in terms of monetary support. This is about engineering education but I believe this is generally true of all education. There are basically three components to education. There is a knowledge component which helps you to relate what you know and what you are exposed to know. Then there is a knowhow component which tells you how to use this knowledge in a productive manner. And thirdly there is a character component. And I think the character component is the most important component. But we have crisis in terms of how do we build character in students. I will come back to that later.

The knowledge component has four sub-components. One is the invariant core. You know people talk about knowledge explosion and all that. But the problem arises when



we think it is our duty to provide all the knowledge which students will carry into life. This never happens. In fact students survive despite you in the institute. I am addressing colleagues and all fellow teachers. If students were completely dependent on what I taught them, I will be so frightened by the responsibility that I will run away from my job. All I do is that I teach them general principles and they learn on their own. In fact our previous Director used to tell our

computer science graduates upon graduation on convocation day “Sorry guys, half of what we taught you is now obsolete. You have to go out and learn again”. So I don’t think one is talking about superficial knowledge, one is talking about fundamental principles, these don’t change as fast. This is why many of us last as Professors for 30-40 years. You can teach because you know your fundamentals. That is the invariant core.

Second is constantly improving empirical knowledge. This is where the explosion is. All these nano materials; the real change is not in the fundamentals. We already knew molecular theory. Nano is just a buzz word. But on the other hand the knowledge of the properties and their application is new. That is the empirical knowledge you don’t have to teach it completely in the university. You only given them an exposure and they will find it themselves.

Then there is constantly changing application. I think it is important in the universities that we show them current applications and not talk about old applications. And the last one is rapidly changing tools. In fact the most rapidly changing tool is the computer itself and the ability to compute. Problems are so large that it changes the nature of the problem to tackle.

The third is the character component. I will come back to it because it was an important component of our learning but I am afraid we don't know how to build this very well. Let me talk a little about changing environment. First is government funding. In India, actually government funding has gone up. But the irony of it is that the amount of money required is always greater than the amount of the money given by the government. But in IITs, for example, we cannot complain because over 50 percent of the technical budget is given to 12 institutions. So if the total budget is fixed, we cannot ask for the greater share. So we need to seek other sources for fund. And I must tell



you in this context that even in the best of universities in the US, 85 percent of the funding comes from directly or indirectly from the government. In the MIT in the US, it is a private university, they have a huge collection of fees and they still get a large grant from the government plus the industrial support they gain in terms of sponsored research which eventually benefits the industry in terms of tax concessions. All that tax government would have collected, they don't collect and the money comes to you through industry. The advantage of that kind of funding is that it is more focused. But the government funding per se is not going to be adequate. You have to seek other resources for supporting research. I want to point out that research is an expensive undertaking. There is a notion that research is less expensive in India which actually is not. The researcher is less expensive but the instruments are 40 to 50 percent more expensive. So I pay more for scientific instruments than MIT pays or MIT can afford to pay much more. Currently that is the reality, and so we have to face the fact that in research, half the funding goes for the equipment. Therefore, research is not less expensive in India.

Next is technology. As soon as technology comes in, what really happens as far as governance of the institute is concerned, is that your accountability increases. Because technology, especially information technology, makes the information available and we have all kinds of new accountabilities. We are accountable to society, to the government. In turn the government is accountable to the people and this gets coupled very easily. The next point is continuing education. You know that our skills get obsolete so we need lifelong learning. That means universities have the responsibility of devoting a large component of their effort into continuing education. I think it is going to be more and more important. I have already spoken about the accountability and the society is reluctant to support higher education purely as an investment for the future. There is a perception that educational institutions have to do more. I will discuss that a little later.

I want to point out one concept first of all. I believe education is about survival skills. There are two kinds of survival skills. Survival skills for the individual for example,

institutes like NIIT which train you for a specific job, give you the survival skill and these survival skills really speaking are information which is available in plenty on the web. Now there is abundance of information, but you don't know which is right and which is wrong. So the real difficulty is there of separating signal from the noise. It is not the availability of the information per se.

The next thing is consciousness; I am not saying this in a cynical way. By consciousness I mean tolerance, for example, having the same set of flats. Purchase manager, sales manager, and the marketing manager of different company living side by side. Each has his own *Dharma* and they may appear to be in conflict. The idea is to be able to see the other persons *Dharma* and live peacefully with him.

In the last, some professional skills are required for survival. In fact the professional skills which are required, as management education point out not so much knowing profession as much it is knowing, who knows. So you don't have to know all skills for individual survival but you have to know who knows and you must be able to network.

The larger purpose of higher education it is refinement of mind. In fact I go around saying that education is art of living gracefully with ignorance. I used to say partial knowledge but if you say ignorance it makes bigger impact, but the idea is that if higher education refines the mind it helps civilization to survive. That is the most important service of higher education. For this you need knowledge and abiding faith as an educationist that such knowledge has the power to improve the quality of life of all the people. This faith is very important. You must believe that this is true.

Contextualization is also very important. We need to know the history. Prof. Ved Prakash pointed out that we do have the crisis of identity. The identity crises comes from the fact that we do not understand history. We go back fifty years or sixty years but in the country like India we ought to go back 5000 years to know where you came from.

The challenges due to these environmental changes are:

1. You need a governance mechanism and the governance has to have a vision and goals.
2. You need to have revenue generation model, and ways to seek donations for education by appealing to the society so you have to create endorsements. You have to do networking.
3. At the same time you have to preserve autonomy and academic freedom. I think they need to be preserved while meeting the increased demand and maintaining the standards.

In India, this is particularly true. Prof. Ved Prakash talked about this project on national programme on technology enhanced learning. Shri Sudeep Bangerjee was the Secretary when this huge project took off. This project envisaged that we are going to have shortage of teachers. I made the proposal. There were 3000 engineering students entering the system and we had acute shortage of teachers. In the next three years the number had gone up to six hundred thousands students. It is not just numbers. It is the rate of expansion. How you are going to meet the need of teachers especially in the

economy which pays the teacher one-third what it pays to almost to any other professional. So this is a serious problem and you have to worry about it and you also have to maintain standards at the same time. Coping with the knowledge explosion I told you about that.

Finally, it is retaining a perspective while dealing with contemporarity and relevance. The problems we have, at least with my generation, is that we have a feeling that if we tell the younger people what we value, we are afraid of being called bores. My father was not worried. Our previous generation never worried. They just said what they thought was right and repeatedly said it. You might have called them bores, but you realize afterwards, you find whatever they were saying was the truth. But we have not done that. In fact some of my colleagues are afraid of being alienated with children. These are the western words which have come. If you have affection in the family, it will never happen. It is unlikely to happen. Once you say the words, you may precipitate the very thing that you fear. I think you have to be careful about not saying these words, not using these descriptions. But I am afraid that this is something that we have to deal with. I will talk about it again a little later.

So in IIT Madras in 1996, our Board said that we should come up with a strategic plan. In response to this, we came up with a document. This document is on our website; you can see it. This is quite a good document. In fact I wrote this document. There were two people involved; one was the management specialist who did the exercise. We discussed it in great detail and we came up with a vision 2010. This document gave us a unity of vision and it was able to unify us. We could go back to the faculty and say we have to do this because this is what we have promised to do, and this is what we plan to do. We told them that it is not a Bible. We could change it as we went along, but of course we should have good reason for not following it. When we finished writing the document and presented it to the Board, I was left with the feeling of being an outsider in a plan of my own creation. I don't know how to express it. Very often we have heads and hearts; our heads seem to plan the western way while our heart goes to eastern way. But still we cannot change them. Somewhere we do not work in face. Unless what you express in words conforms to what you feel in the heart, you will not be able to take it forward with passion. Incidentally this is not a criticism of western methods. The idea is not to criticize it. The idea is to point out that we cannot take it over lock-stock and barrel. We have to adapt it to our culture. So question here is that even in the west, these dangers have been pointed out. First of all, money rather than scholarship is a driving force in the US. I have been there as a graduate student and ten years later I went there as a faculty member. I see this transmission that these Professors who brought money have become much more important than the Professors who were scholars. This is an issue with time because fundamentally there is a difference between the university and the industry. The fundamental difference is that the university thrives on unity and knowledge, whereas the industry thrives on differences. That is the nature of the industry. These differences lend you competitiveness and therefore help produce profits. University thrives on unity and knowledge, and seeking unity is the purpose of a university. If you are driven by corporate support and if you are not careful universities values can be destroyed. Universities can pursue research which is really a cheap way for corporate to get their

research done. I think that risk is even higher in India. So you have to really have some faith in seeking unity in knowledge and therefore support the university system. It can lead to neglect of teaching and it has happened in several places even in the USA. It can happen in India as well because even in big systems it is research which is rewarded. If you are a good researcher and have publications, you get promotions; your teaching is not rewarded. However teaching is far too important to neglect. Meeting the enlightened demands of the funding agencies is another risk. In fact it is happening in the west and it is happening here also. I was telling this to the Secretary Dr. Ramaswamy, a good friend of mine, and he is aware of these things. I told him that at least half the research projects in DST should fail; otherwise it is not supporting current research. But the way research is supported is that at the end you have to show that all the objectives have been met successfully. If all the objectives can be met in the three years exactly, that means you are not doing research. You are just doing extension of what you already know and you are sure that it will work. Therefore, you are succeeding. I think it is important for us to realize that. Finally the danger is that agreement could be replaced by bureaucracy. We run a greater risk than the west and I want to quote from Charles M. Vest. Charles vest was the President of MIT for ten years. Surprisingly he was a philosophical person. He ran a university like MIT having lot of research on clinical side. University, he said, should not allow to its being preoccupied with all consuming routines that can lead to suspension of its faith. You do things on faith. The greatest problem for the university is not a disordered structure but the administration's tendency towards bureaucracy that can disturb the balance between trust and accountability. Import some values in the community under the guise of incentives. Such incentives are the last gasp of academic institutions in trouble. That is why I am opposed to all monetary incentives in academic institutions. In fact I keep quoting our philosophy; it says that goddess of learning and goddess of wealth do not live in the same house. So if somebody chooses the goddess of learning, he may as well forget the goddess of wealth. It is not that we are poverty stricken. Our salaries are quite reasonable. But if you compare them with those of others, it leads you to feel discontented. Personally I feel, we run much greater danger than the west for bureaucratizing our educational institutions. Our educational institutions in that sense run the risk of becoming certificate issuing bodies. The idea of education as refinement of the mind will go out of the window very easily and I think we have to be very careful about it.



I will just reiterate the core values first. The universities' commitment is to create a community of learning and this idea of learning is by sharing. It is one of the few places where you can confess your ignorance. A CEO cannot afford to confess because he cannot afford to show to his subordinate that he does not know where he is going. Whereas a Professor can clearly say I do not know. I think it is a big

advantage. I think we should realize that discoveries occur in the confession of ignorance. We should pursue research and ensure its dissemination; that is an important role that we have to play. Dissemination is also very important. I think we have a social role to play. When the Union Carbide tragedy occurred in Bhopal, it was very easy to blame the company and to blame somebody. I am not defending them. But what role did we play? In fact I am a chemical engineer. Some of my students have been working there. Some of them took ten years to get over the guilt. The point that I want to make is that as chemical engineers we should have written popular articles, warning the public and making them aware of the danger associated with the system. They had four safety devices, all of which failed and methyl cyanide leaked out and a lot of people became blind and there were deaths also. But if we had written enough popular articles alarming the public then perhaps this would not have happened. We did not educate the public. I think that was our mistake. I think it is important for us to write popular articles on technology without sophistication, but simply explaining elementary dangers which could occur. That is the best protection. A well informed public is the best protection against exploitation against such disasters.

Let me share some India-centric thoughts with you. First Professor Ved Prakash talked about our identity crisis. We are an old civilization but we have had 250 years of British rule. We keep saying that if you had visited India 150 years ago you would have found great orders. But behind that order was fear. It was not self discipline. It was fear of the police. It was fear of the British rulers and what they could do. And that is not the kind of discipline you are looking for. If you look at our old civilization, we have a long and rich civilization. I must tell you two quotations from Macaulay though I don't remember the exact words. Macaulay said this in 1835 and 1842 when he addressed the British Parliament: "I travel the length and breadth of this country called India and I find the people of India have such integrity such discipline and they are so cultured that it is impossible for us to colonise this land unless we do two things. First introduce English as a language and secondly convince them that English culture is superior to theirs". They successfully did that. I cannot blame Macaulay. He was an excellent administrator of his majesty. He was dealing with huge problem of a colony of three hundred million people with few administrators. The second thing he said is even more damaging. We could get angry but if look at it from the British man's point of view, he was right. He said, "The rules for the majesty's own people should be based on trust whereas the rules for the people in her majesty's colonies shall be based on mistrust". And in fact when we got independence, we simply replaced white heads with the brown heads but we kept those rules that were based on mistrust. So in India, very often we share this thought that we do not have sins of omission; we only have sins of commission. So anybody would be afraid to act. If you don't act you are safe; that is the philosophy of colonial rule. We did



not change our rules. Therefore, these problems have arisen. We progress because here every now and then you meet people who are enlightened and who take the risk. Therefore, we progressed. It is sort of progressing against self created constraint. That is our identity crisis. So we have to know who we are, and I will say a few words about that. Gandhiji suggested that the real things are truth, fearlessness and non-violence; these important things we need to adopt.

While science and technology are universal, scientists and scientific institutions have the national identity. Shri Sudharshan Mahajan wrote in an article that science is universal, but each of us as scientists has our own prejudices. You cannot help it, you are a human being and you are going to have prejudices. Question arises: can you bring together minds which have different prejudices and come from different cultures. In fact the success of USA graduate schools is primarily because it managed to get together people from different cultures. It was an accident, it was not designed. But it seems to have helped them tremendously because if a Polish fellow has a prejudice, the Indian fellow would help him to overcome that by saying it is not true as he is not inhibited. Where an Indian prejudice is overcome by a Chinese and so on. So this has happened in USA naturally. I think we have to take lesson from them. In higher education, we should internationalize our institutions, so that we may have people coming in from different cultures. Because they would bring in different prejudices, therefore it would help to overcome local prejudices.

Traditional Indian culture was associated with non-violence and appreciation of arts, pursuit of knowledge and wealth in that order. Unfortunately now knowledge and wealth are being interchanged. The order of pursuit is being interchanged. Our philosophy advocates adherence to Dharma. It is a difficult concept to translate but we all have a feel for it. I think it is important for us to realize what the Dharma is for each individual and what is his role in society. These are easily spelt out now. We don't have to make an effort to do that and pursue it. But I am afraid we do not do that. *Upnishads*, for example, clearly say this. I must tell you that I am not a Sanskrit scholar. All my



knowledge of *Upnishads* and Indian philosophy comes from listening of discourses that I have attended a number of times. Let me explain. Some of these concepts are so beautiful. Our philosophy says that there are three obstacles to learning which impede the process of learning. One is in the observed and the other is in the observer; the third is in the mind i.e. process. It covers the object of the study we are pursuing. It can be removed

according to our *karmayoga*. You can ask what is the process by which it should be removed. But the concept is that there are three parts and you have to remove these by

some process. The process may be different for different individuals, but I think it is important that we recognize it as an important observation. The second is fickleness, the inability to concentrate for a long time. This is overcome by *Upasana* which is devotion to God. The *Awarna*, the veil over the mind is removed by *gyana*. The *gyana* is knowledge which comes by a guru guiding through it. So these are the fundamental concepts. And we have to re-examine them in modernity since they are important. *Upnishads* also say *atmanamvidi* which means know thyself and be free. Friends, we are not pursuing this particular concept in science or in any other subject. Though these appeal to everybody, but we do not know how to incorporate them in our education system. We need individualized education system, and by individualized I mean for the nation. Each nation, Swami Vivekananda said, has a central theme, the principle theme around which every other node comes to form the harmony. He said that for India religion is the key node of the whole music of national life. Religion means philosophy of life; it does not mean choosing one over other. Social life and political life have to be preached through the vitality of religion. It is age-old faith in the mortal soul.

Ravindranath Tagore said, ‘Man is not powerful but perfect’. I think it is an important point. Since the industrial revolution, the west has been talking about overcoming the nature. I think there is revival in the west, with the environmentalist coming back in the picture. We never had this concept of overcoming the nature. In fact I remember that when we went to see the Niagara falls, my adviser who took me there while showing me a tower on the other side of Niagara, he enquired whether I was impressed. I smiled and replied, “In India we would have never built a tower. We would have built a small temple by the side of the river and would have said ‘*Niagara mata ki jai*’. That is our natural reaction. I am not blaming them, I am just describing that to you. What we are doing now is copying them without the heart. Ravindranath said it beautifully, “There is a genuine risk of breaking up with technology. The wholeness of humanity by deadening its will, numbing its thoughts and making its movement automatic. Turning a man into a graduate without human values is like turning a tree into a log. It will burn for you. It will never bear living flowers and fruits”. I think it is beautifully said but somewhere we ought to be able to say this without being ashamed, without our students saying that we are talking rot, we are talking idealism. My contention is even if they say so, we should continue saying whatever we believe in. In fact I am reminded of Mark Twaine’s statement. He said, “When I was fourteen, I found my dad very stupid. When I was twenty-one I was amazed at how much old chap has learnt in the last seven years.” Who has become wiser? So I tell my students they should criticize only after seven years when having left the school. Because I hope in seven years, he will realize that I am not so stupid as he thinks now. I think we should not worry about their opinions. We should ask ourselves whether we are true to ourselves, then the rest will follow. There is another beautiful story, that will thrill you. I do not know how to communicate this to the students. Goshtipurna taught Ramanuja the *Hastakashri* and said, “Those who will learn it will attain *swarg*. So don’t teach indiscriminately. You have to select your audience.” And Ramanuja straight away went to the village temple tower, stood on top of it and said ‘Come-come’. I will give you *moksha*.’ And those days they all came running. Now you have to say, “I will give you billion dollars”, before they come. Then Goshtipurna became very wild and said, ‘How can you do this’ Ramanuja was aware that if one

disobeyed a guru he would go to hell. So he said to his guru, ‘Look at the number of people who will attain *moksha*, what if I am condemned for disregarding my guru’s words’. The follow up is that Goshtipurna actually fell at Ramanuja’s feet and said ‘You are the true guru’. This kind of a story will evoke a response in all of us. But where do we tell people in this selfish world that selflessness pays. In long term, it is selflessness that is important. Again in Bhagwadgita, man’s right is to his prescribed duties, never to the fruits thereof. He is not the cause of the result of his actions yet he is bound to his duties. Work done with any expectation of results or reward is work for bondage. Actually what is a source of liberation? Honesty in the performance of one’s duties amidst the confusing realities of the life. I don’t think I can do my duties if I do not believe in this. If you think you are the cause of everything you could be very alarmed. You know that there is a bigger man and you have to have that faith. So you don’t sink in faith but you are not responsible. I am not saying you can be irresponsible. But remember that you are not causative of actions and results. Let me get back briefly to the history of education because I want to highlight some aspect of it. We originally had a Gurukul system of education, an education system in the home of the teacher. Then writing was discovered some five thousand years ago, and people started writing manuscripts. Then slowly education shifted to monasteries. As early as 300 A.D., we had Nalanda where ten thousand students were studying at a time. In fact I keep telling my students ‘don’t crib about entrance exams because Nalanda had forty-five minutes viva for every student, and there used to be 12 people on the panel’. It must have been very difficult for the students.

Then printing came, and libraries became centre of pilgrimage. This was 5000 years ago. Till that point, emphasis was on building the character. Then came the industrial

But where do we tell people in this selfish world that selflessness pays. In long term, it is selflessness that is important.

revolution and we needed hands. So they had the assembly line process. In fact the present university system was discovered soon after the industrial revolution, a method of producing students by a factory like process. In India, the British did it with good intention but they came from a very small country. They came and said that education should be state responsibility and not the responsibility of the community. Earlier it was community responsibility, which meant education was relevant. I think that was a very important aspect we lost in history. I don’t know if we can recover it but we should atleast attempt to. Later we lost sight of character that character was the most important component of education. I think that is something which happened automatically, because industry was insisting on manpower with certain specific skills. Fifty years ago, the information revolution came along and with that the worldwide web now has democratized education to a point where you now have *shishukala*. Student can sit in his house and through Google can approach all the teachers in the world. He can get the best specialist in any subject he wants. How do we handle it here? We are used to a certain level of respect for guru which is clearly declining. In *shishukla* you respect the *shishya* and how can you socially handle this if the guru is paid lot of money. But if he is paid money, he is no longer a guru. He is working for commercial interest. So I think we have to think very carefully about how we handle this.

I will say a few words about teaching and about learning as well. Aurobindo has a beautiful book on education. Aurobindo may be difficult to read because his sentences are long and very often you have to look up the dictionary even if you know English well, as he uses words which are not so common. But he makes beautiful points, if you read carefully. The first principle of Aurobindo is that nothing can be taught. It means that teachers are actually facilitators of learning. This reminds me that when I first went to the USA, one of the Professors took me to hear one pastor. He said that I should listen to the guy, as he speaks very well. The pastor spoke well but he repeated himself seven times. So at the end, I asked him, “How come you repeated yourself seven times.” He said, “Did I do that, then I did right. Because in the school of pastors they tell me that only one-seventh of the congregation is listening at any time.” So what is important is that you have to repeat your message as a teacher. You only repeat your message and some time you will facilitate learning at some point.

Aurobindo’s second point is that it is against the Dharma to force education on an unwilling mind. I think you have to let the mind seek what it wants and teach him in that direction. I am afraid our system of mass education is not going to permit that.

Thirdly, work from near to far. This is easy to do if you have data from outside. For example, I teach pollution, and the only data I have is for Los Angeles. How is it relevant to a student sitting in Chennai? This boy has come out of school and I take the case of Los Angeles because I cannot take any other case where the data is available. We don’t have enough data on our own environment. We don’t collect and document data. So I cannot use the data and illustrate what happens in Chennai. That is working from near to far.

Then there are variety of subjects and diverse approaches. What Aurobindo says is that subtleness of mind as well as comprehensiveness are built only by diverse approaches. I am reminded of another story, an anecdote which actually happened. Professor Kelkar was the first Director of IIT Kanpur. He is a great educationist. One of my friend who joined IIT Kanpur, went to him at the end of semester. He said, “Professor Kelkar, I cannot cover the portion of the syllabus.” Professor Kelkar said, “Sit down young man and have a cup of coffee, I hired you not to cover the portions but to uncover part of them.” I thought it was a beautiful statement that I keep telling my colleagues, “don’t try to teach the whole thing written in the book, so don’t cover the entire portion, you are not writing the exam. You teach only those chapters that excite you. Then the students would see your excitement and read on of their own.” Anyway, the students are going to read for the examination. So you make it interesting for yourself and interesting for the students. The idea is really to teach one or two topics very well. I have said it in the schools and got into the trouble with principals of schools and colleges. But I believe the result will be the same. In fact the results would be better if you only uncover a part of the portion.

The last principle is importance of the repetition. I happen to be a Vaishnavi. One of our gurus was in Anadmans. He was a friend of my grandfather. In the Vaishnava tradition

you have to go through marriage, have children and then go to sanyas after you have seen the children through. Our guru had become a sanyasi that way. He was a great scholar. He knew English, he knew Sanskrit, and was a beautiful story-teller. I used to listen to him very carefully. I asked him the same question, i.e. why he repeated himself. He looked at me very kindly, and told me that after all his study for 30 years, he had learnt only five tools and his duty was not to be original but to repeat the five tools for the benefit of everybody. I didn't realize at that time that it was a profound statement. And suddenly after many years when he is dead and gone, it strikes me and I wish I could go back and ask my doubts. But he is not around. However, the important thing is that it is not so much your originality as to what you communicate to others.

Now something about learning and creativity, in our cultural context. Rager Sperry got his Nobel Prize in 1981. He was neuroscience physician and his co-workers did a lot of science experiments, called split brain experiments. They were looking at patients whose brains got damaged during accidents, and trying to find if the right brain is damaged what you do with the left brain. They treated the patients and also did experiments on this aspect and recorded them. The summary of their experiments is nicely summarize by Glaxcil, in "The right brain". It is a very nice book. The simplified summary is like this. There are four stages of learning. First of all there are two parts of the brain, the left and the right part. The left hemisphere is logical, very good with words and very good with step by step reasoning. The brain on the other hand is imaginative; it is free from logic, good with music but it is inarticulate. So if you lose your left brain, you won't be able to speak. After about six months, right brain will learn the left brain's activities and you will come back to be normal. But in any case, there are two distinct roles. The roles are like this. There are four stages of learning and creativity. The first stage is preparation stage, the stage of information gathering. When your left brain helplessly gathers data around. I keep telling my colleagues don't worry about students whether they are listening to you or not they are all the same gathering and collecting some data. And sometimes about you, it doesn't matter.

The second and third steps belong to right brain. The right brain incubates, wonders about all this data and finds out how to make sense. The third step is called the enlightenment step when the right brain thinks that it has found the solution. It thinks that it has found the model by which it can describe all the data which you have collected.

And the last step is called experimental verification stage. If the model of the right brain is right how will you verify whether it is right or not. In historical terms, both in Hindu and Greek civilizations, most of things stop at third stage. The last experimental stage actually came effectively with Galileo. This is because the intuitive or illumination stage was for the sage or wise man. So people didn't question. But after Galileo, people started asking lots of questions. In fact, now good scientific theory has to propose an experiment which may even lead to its demise. That is one test of good theory. Now these are four steps. The claim is that synergy between the two parts of the brain leads to the creativity and if the right brain's liberation from logic allows it freely to imagine models, it is intuitively able to come up with models. But very often these models are wrong. Otherwise all of us will be Einstein. Ninety-nine percent of these models are wrong, and

occasionally this intuitive sight is so right that it fits all the data. So you need experimental verification as well. In fact I have a story from a Greek tradition. Aristo, for example, said, “Woman have fewer teeth than man”. Till 1400 nobody questioned this.

Our feeling was intuitive in sights even in science. We didn't separate science from other subjects. Even in science, there is humility and faith in god. This is a cultural characteristic which give you such a character. In the west, they ask either you call yourself intuitive genius or logical genius. And our students have adopted this thinking automatically, so they get somewhat arrogant. From our cultural perspective, arrogance leads to loss of intuitive knowledge. I think that is also Indian culture. The other cultural aspect is preparation stage for data gathering. In our culture, it was believed that the adult brain, the mature brain has to limit the data that is exposed to the young brain. Young brain is very sharp, quick and understanding, but you have to select the data because some of it could be damaging at an early stage. They will finally get the data. This is not the cultural aspect of the western scientific tradition as it says no no, you must give all the data. In a sense we are shirking from the responsibility. I give you a small illustration. I was invited by Germany as soon as I became Director. This is a tradition. One of our student was doing mass project in Germany. The concerned professor told me “you know you has sent me a boy and I have made a man out of him”. I asked him what was the hurry. That is really my attitude. With our children, we look after them and we keep careful track of them. We interfere even long after they want you to stop interfering. Even after they get married we try to tell them what to do. This is our cultural way of doing things. There in the west they want to get rid of the responsibility by the time the child is 15 year old. When they declare him as an adult, then their responsibility is over and the children are supposed to take care of themselves.

So it is sort of cultural thing when you declare a person an adult. It has nothing to do with being a bad parent. It is the societal set up. They are also very fond of their children. But I think there is an important difference. I think it is a data gathering. We place lot of value in our tradition of not exposing our children. In fact an other illustration is the nursery rhymes. For example, if you look at them, nursery rhymes are depressing, except the nursery rhyme ‘twinkle twinkle little star’. Humpty dumpty completely breaks, Jack & Jill falls and it will come tumbling after. There is no end to it. We used to wonder. I learned English much later. In fact when I was small, my grandmother would tell my father the he should not relate such story to a child. All the stories have to be healthy and nice. You have to paint a rosy picture. The child may get disappointed later but not when he is a child. This is a cultural difference. It is not that one is superior to the other. You must recognize that we have cultural tradition of having the right to filtering the data that is gathered. But we do not do that because we are afraid of becoming unpopular as children might call us reactionary, and that we were living in an ancient world.

From where these values come in education. I feel that values come essentially from practices and structures. Societies inculcate values in young children. Take the case of extended families. We had grandparents telling mythological stories to the children.

Parents never had times to do that. Grandparents used to do that. My grandmother told us stories about Hanuman. We had this distinct feeling of a man who is upright, has strong characteristics. But when we go to Amarchitrakatha, it is not a criticism because without it many of our children will not know Ramayana, it portrays him as a monkey god of great power. So if you read only that, you come up with a feeling that he is a Heman. That is no concept of Hanuman at all. His ability to be a good messenger, having straight forwardness, and strength, all these are interwoven in Ramayana. If at all a grandmother tells a story, then the values you get are different than the values you get from Amarchitrakatha. We have now lost that aspect because of breaking up of the tradition of extended family due to economic reasons. We have lost that particular aspect.

Second is public discourses and their repetition. You go on hearing these discourses around you, when you are in receptive mode. Suddenly you understand why they repeat it that is gone. Rendering justice by a village panchayat actually worked before. We have Panchayati Raj but that is only an artificial way of getting it back. There used to be five people who were trusted. I have actually seen it myself in my village as my grandfather was a member of the panchayat. So I have seen this and all of this has gone. British essentially replaced it by law. But the law is only a technicality that has nothing to do with morality or ethics, where one wins who has a better lawyer. So it is a simply a technicality and how do you argue that is what counts. How do we express it in modern medium, our cultural values? As far as I can see, it can be only by repetition in the institutions of learning. I think it is going to be very very important. We have started some groups like this. We have a group called Reflections. You can't blame the young kids. Four fifty youngsters come voluntarily at 7.30 for discussion, as if they are not interested. My only criticism of the younger generation is that they think life is hundred meters race; they don't realize that it is actually a marathon. That is my only complaint, otherwise they are very knowledgeable, they are very bright, they are a very sensitive. The other thing is the undesirable character traits. You all know of *karma*, *kroudha*, *mohalobha*. I want to mention *mattsarya*, the one translation is jealousy, and the other translation is competitiveness. In our culture, in the ancient culture itself, you should compete with yourself not with others. If you compete with others they have different talents and because of that either you will get pains or would be jealous. Neither of which is valuable. If you compete with yourself and do the best, you can't do any better. So If we could do that we will not have those other feelings. I think it is important to follow. Even if you don't follow that, at least communicate the idea.

IPR is another thing which bothers me a lot. You know our *Vedanta* says there is nothing new that a man discovers; as you mature more, you see more. So original ideas are often triggered by chance meeting a prepared mind. Especially in the universities, a whole lot of us hold discussions. One fellows would says something and you get an idea from it. Whose intellectual property is this. It is his or yours. Business of intellectual property conflicts with my *Dharma* as a faculty member and as a teacher. As soon as I understand something I am supposed to explain it to everybody and share the joy. Now they say no, patent it first. By the time I talk to the lawyer the idea, I would have lost all the excitement in the idea. And I don't want to tell anybody that. Is it to tell everybody that I

want to make money out of this. So this is very serious issue, especially in the context of universities. I have an IP cell, I have a patent lawyer. I also produce results because I have to conform to the system. I am advocating this very strongly that universities should not do any patenting. If we have intellectual property right, I don't mind selling it for a lumpsum and that lumpsum will be used in the university. But university should not do any patenting. This business of intellectual property right and being possessive is contrary to the *Dharma* of a teacher in my opinion. So there is intrinsic conflict between integrity and intellectual pursuits of learning through IPR. Is true sacrifice a pre-requisite for long term benefits? That is what we were told and that doesn't seem to be there any more. Isn't that we try to confess our ignorance and in an university we pursue truth without any hope of actually reaching there. It is semiotic. You only go towards the truth. I think it is an important concept, and universities have to preserve that.

So at the end I just summarize the concerns how does one make the spirituality the central note in secondary education. I am not talking in the air, I am talking about ethics built in every step of secondary education. How does one teach values before imparting technology education? How does one teach value of selflessness in self centered world? This is a Ramanuja story I told you about. And about teaching values again we have an old story of a king who went to the guru and said, 'Teach me, I want to learn'. The guru said, 'Come back after when I am gone'. The king wondered what this fellow was saying. Once he was gone, how would I come. After one year, he went back and said, 'May I learn from you'. Then the guru taught him. He said the 'I was the ego in you and because that you were told to come back after your ego was gone'. I think it is a beautiful concept, learning requires humility. We have treasure of such stories and don't know how we can incorporate them. Do we ask the students what he is looking for. Do we teach him values and that is a question. Do we dismiss all this profound ideas as vague metaphysics or attempt to discuss them? We teach so much and we spend so many hours with the students, can't we discuss this also. How do we factor Indianness into our plans? The last one, I will stop with this story. Carl Sagan, an astronomer, who was a very famous teacher, passed away recently. He was in Cornell and has written a book 'Great Entertainer A Teacher' a Book in which he describes an island in Japan, on the coasts and beaches of which cherry trees grow. The monkeys initially fished one of the cherry fruits which had run into the sea. One of the monkeys who ate the cherry realized that sea salt had changed the taste of the cherry fruit. So he carried the cherry fruit and washed it while other monkeys stared at him. Then a second monkey and a third monkey did the same thing. After that hundreds of monkeys followed imitating and started washing cherries. I believe no monkey on the island eats cherry fruit without washing it. Question that I want to ask is that do we have hundred monkeys in India who care? When we will have, all others will follow. You need a minimum number. I don't mean to insult the audience. As teachers, do we have hundred believers who will take it up and then we will go further. Actually to whatever I have said, our students would respond very nicely. At the end of it, they will say 'Hey, here we are' and hundreds will put their hands up in the air. I will stop here. Thanks.

Presidential Remarks

It has been my privilege of knowing Prof. Ananth for a few years. He has often spoken about his concerns in an extremely engaging way. I suggested him that one of these days he should come and speak to us. I am delighted that this has happened and I would not like to dilute what he has already said. By adding more words in the similar vein. As somebody said that everyone was spell bound. It is great tribute. The richness the range of issues that he has raised in a short discourse is a something that we would need to reflect over for quite sometime. I hope in the National University we will take it up as a challenge in some sessions with different people. The challenges that we normally think about are setting us right. Now in our country, these appear to be very mundane and simple challenges, till we come to the kind of different order of challenges that Prof. Ananth has brought up before us. It is not that we have not really graduated on to these higher order questions in any of our discourses. I think Prof. Ananth's remarks today should help us to graduate on to asking these more difficult and engaging questions and enrich our own institutions by raising these questions. I am reminded of one American scholar who said that one of the things that administrators need to have is that they should be able to deal with the territory of their ignorance. Very true, most people are competent with their knowledge, with their areas of work, but whenever we have to deal with situations where we have to deal with our own ignorance and yet because the administration puts you in a leadership role you have to take decisions on those territories of your ignorance. Like in university system, you may be a chemical engineer, but you have to take a decision about someone, a faculty member who comes from an other discipline, asking for a grant for some area. You have some money which has to be distributed. You don't know how to choose between, whether it should go to chemistry or physics which are your areas of ignorance. That is the question of education itself. It is not only the administration. Education must be alert to dealing with its own areas of ignorance. Education has this implicit thing that they know. Educationists think that they know but they don't know their own ignorance. That teachers think very often that they know and this is what the knowledge is in capsulated form. That it is a different kind of seeking. The educators must realize that their areas of ignorance are much larger than the areas of their limited lucidity that they have. Prof. Ananth's talk today, I think, has opened up this question of many territories which are unexplored. Unknown means basically unexplored or, what he said, what you discover, what you remove the cover from the unknown. There are many such areas which have been opened up by Prof. Ananth's remarks today and I do hope that we will keep ourselves engaged with those questions. Thank you very much.