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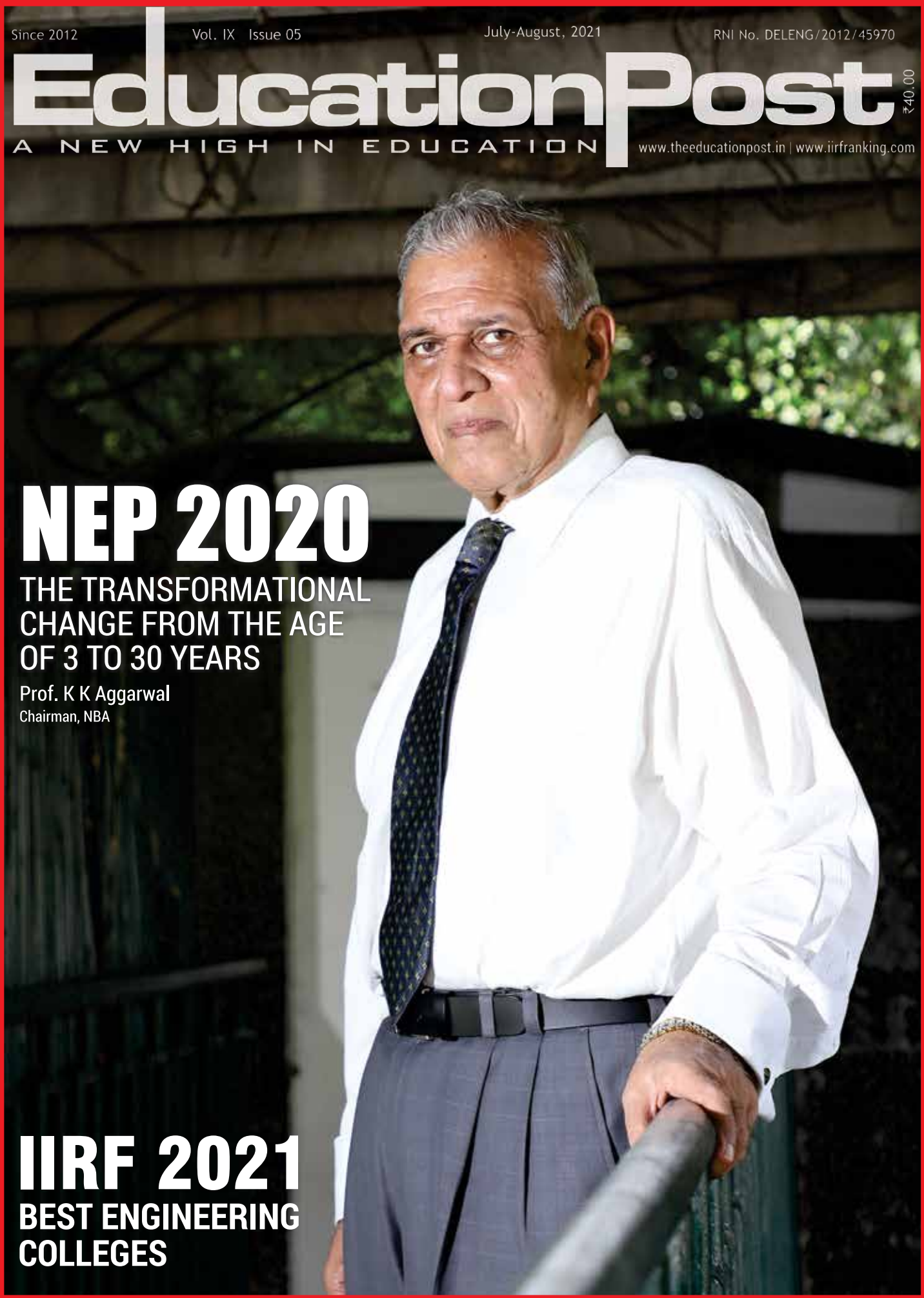

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Prof. K K Aggarwal
Chairman, NBA

IIRF 2021

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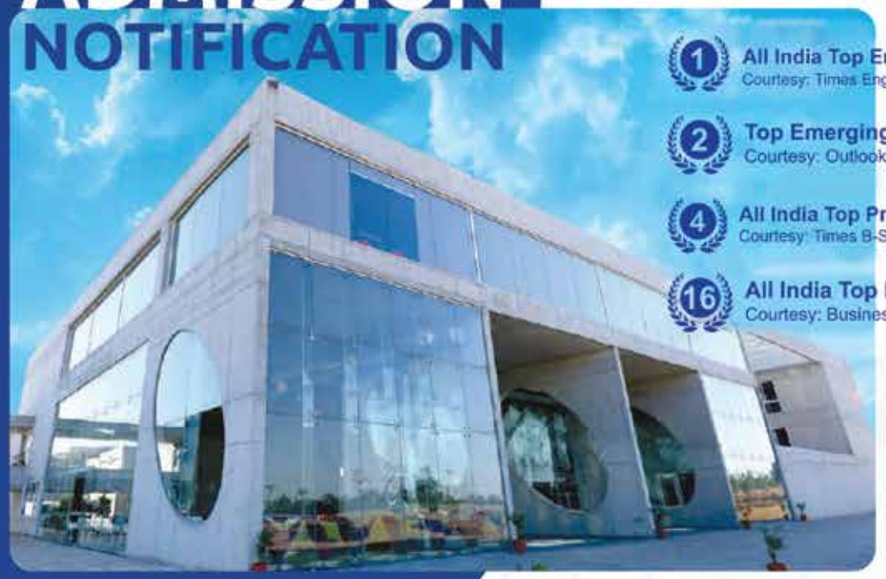

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ENGINEERING EDUCATION IN NEP 2020

A REDESIGNED PERSPECTIVE

The National Education Policy 2020 can prove to be a turning stone for India's bright future.

The NEP 2020 has come up with new surprises up its sleeves, that include the availability of scholarships, Online Education, and increasing the usage of technology, and Open and Distance Learning. The National Education Policy will transform millions of lives and boost up new opportunities and careers.

The NEP 2020 has focussed primarily on making Higher Education a companion of a student, making it more student-friendly. It has focussed on more observatory knowledge education and more practical, analytical study instead of spoon-feeding teaching.

Engineers are proudly known for being the backbone of our Country! India is the hub of 25% of the world's engineers, but it lags behind in the innovation and research part. The National Education Policy 2020 has led to a paradigm shift in engineering education. Hence, this study will explain to the common man about the importance of Engineering Education in NEP 2020.

As per NEP 2020 guidelines, The 2021-2022 engineering aspirants will get the freedom to opt for other subjects apart from Physics, Chemistry, Biology, and Mathematics (PCM and PCB).

Traditionally, PCB and PCM combination was a must for engineering aspirants but now NEP 2020 has turned the tables and given relaxation to science students to take up Literature or History, while Humanities students can take up Mathematics or Physics as their main subject. Now, Engineering will continue to thrive.

As far as Engineering is concerned, Engineers are not born, they are made with the right skill set and knowledge. For instance, when it comes to IT, computers, and software, India has the best gem of Engineers than that of its global counterparts. The NEP 2020 aimed at focussing on emerging trends in engineering, like, Artificial Intelligence, IoT (Internet of Things), EV (Electric Vehicle), and others, these are the areas where academics and Industry can work together.

How will NEP 2020 Work for Engineering students?

AICTE has given the statement that for students who have not opted for PCB/PCM in their 12, it will be the responsibility of engineering colleges/institutes to offer bridge courses in these science stream subjects. However, NEP 2020 has called for eliminating compartmentalized education and giving students the authority to opt for the subjects.

The idea behind NEP 2020 is to welcome diverse stream candidates apart from the science stream. NEP 2020 lends a helping hand to the students to opt for varied subjects even if they are engaged in niche courses. Many traditional engineering colleges like IITs are asked to enhance their courses and introduce non-engineering courses.

Devika Bhattacharya
Officiating Editor

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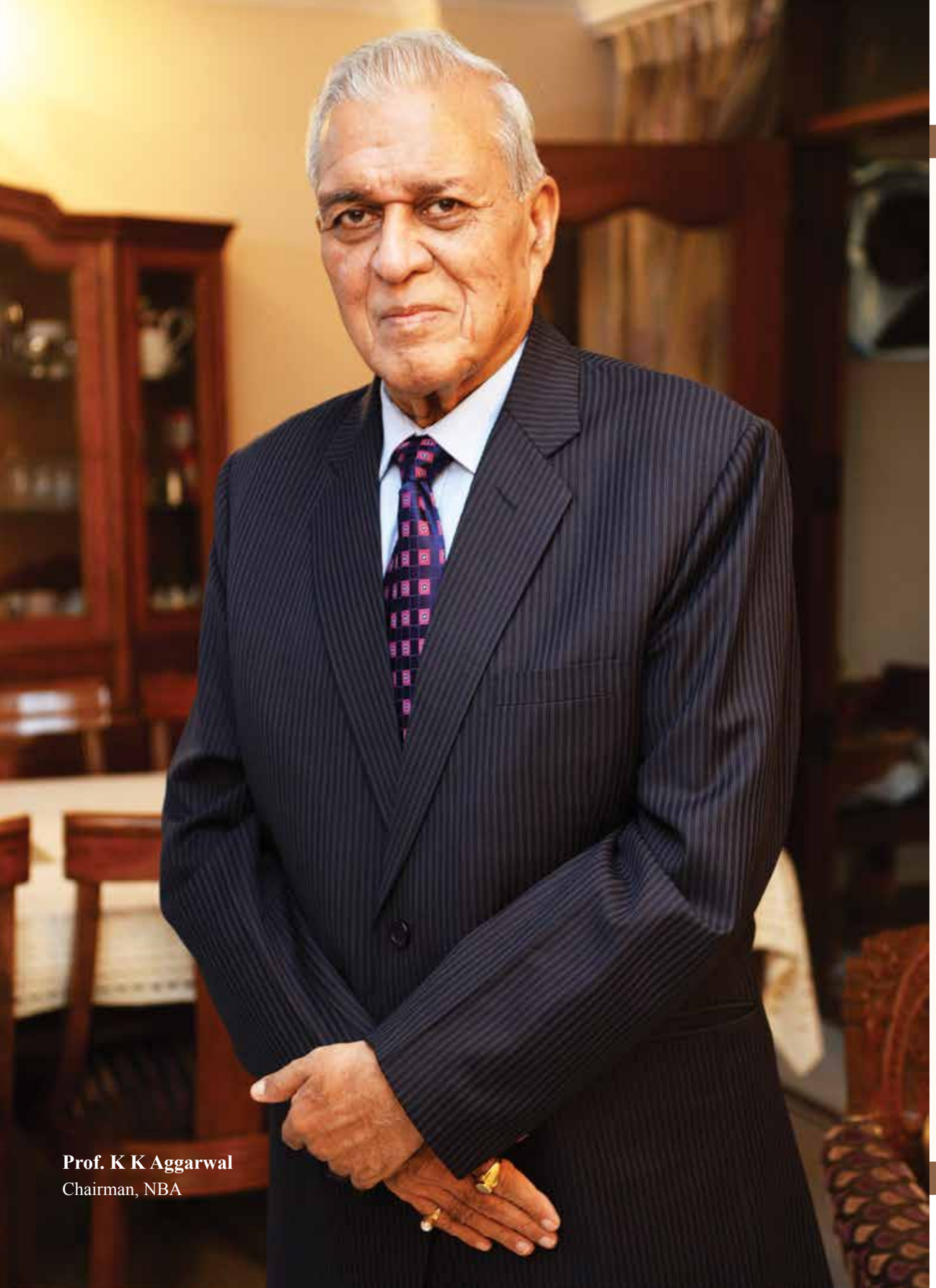


Prof. K K Aggarwal
Chairman, NBA

Prof. K K Aggarwal, Chairman, NBA and Founder Vice Chancellor, Guru Gobind Singh Indraprastha University, has been a teacher all his working life. An alumnus of Punjab University, he completed his Ph.D from NIT Kurukshetra, where he worked with utmost dedication for almost three decades. Prof. Aggarwal also served as Pro Vice-Chancellor, GJU, Hisar for three years. He has served as President of a number of organisations including South East Asia Regional Computer Confederation (SEARCC), Institution of Electronics and Telecommunication Engineers, and Computer Society of India. He has been widely consulted by the industry, most-notably for his contribution towards the Reliability Analysis for PSLV (Polar Satellite Launch Vehicle).

Prof. Aggarwal has published over 200 papers in international journals, and over 400 research works in all. He was conferred the Honorary Fellowship by the Broadcast Society of India, as well as Lifetime Achievement Award by IETE and Computer Society of India. Prof. Aggarwal has been associated with NBA in various capacities since its inception and took over as Chairman, NBA on 14th January 2019. In this exceptionally insightful interaction, he speaks about the New Education Policy, reforms needed in higher education, future of Indian IT industry, and much more.

COVER INTERVIEW

INDUSTRY IS CHANGING SO FAST

We do not know what the industry will require 10 years hence. A study found that in a decade, 65% of our graduates will be doing a job, the title of which none of us knows at present.

Q What according to you are the pros and cons of the new education policy? Is it entirely positive or does it pose some challenges for the universities and the industry?

This policy is quite ambitious, very healthy, but it has challenges. First of all, since it has come after 34 years, obviously it had to cover many gaps. Education had changed so fast in last 3 decades that many things were not being attended to, and when all those had to be compiled in one document, everything needed to be addressed. I think the biggest contribution of this policy is that it has documented all the shortcomings of the system till date. Whether it was school system or the higher education system, whatever we felt was lacking, has at least come in one policy document.

This policy, for the first time, talks about education before the child goes to a formal school, and after he has completed Ph.D. So, the entire spectrum of youth, the age, which has been covered for the first time, from 3 to 30 years, is vast. That is again an opportunity because you weave the thread between different stages, and to have so many stakeholders come together in unifying that thread is a challenge in itself. In the school education, the entire school structure is being revamped, from senior secondary school, we are looking at a 5+3+4 kind of system. The entire schooling system is, therefore, changing quite dramatically.

I may mention, first of all, that compartmentalization of school education is being done away with. Earlier we used to segregate the science student and the humanities student, which will cease. I say this because it has a strong bearing on higher education. At the moment, we are very rigid. If someone wants to join a medical college, they need to study PCB, and if they want to be an engineer, they must study PCM. Now once PCB and PCM will not be defined so rigidly at the school level itself, it is a challenge. Secondly, vocational education will start at a much earlier age in schools. For those interested in vocational training, it will continue at the higher education level as well. So at least these two changes in the schooling system will have a direct bearing on college education.

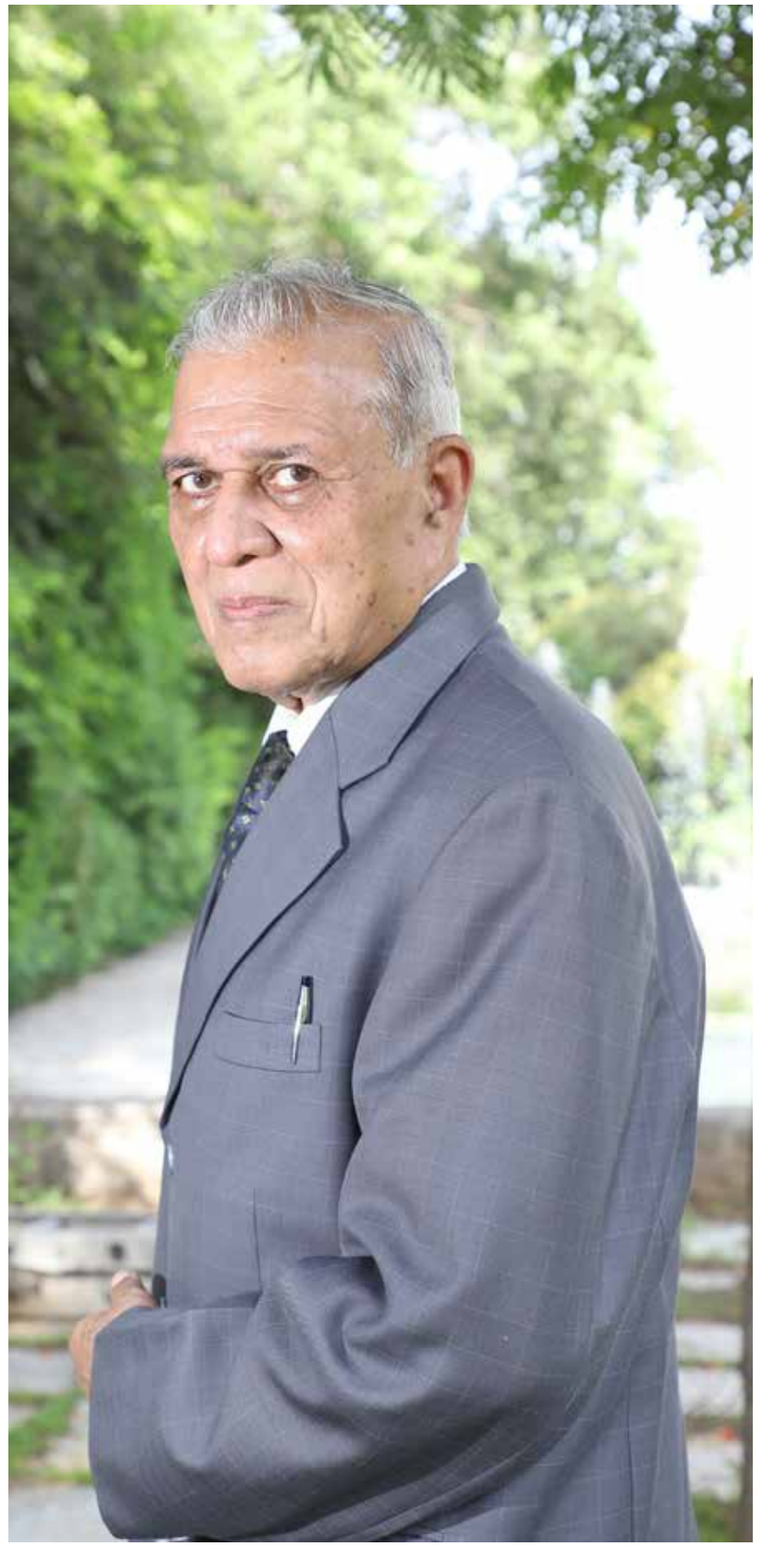
In the university system, there are some landmark changes. For one, the policy will be, by default, inter-disciplinary. There will not be a very rigid compartmentalization of degrees. Depending on the interest of the student, the location and capability of the institution, the student can choose a variety of subjects. For example, it will be possible, for the first time, to choose some subjects of arts and others of science, and design a degree for oneself, which was not possible hitherto. Similarly, in engineering, instead of studying just mechanical engineering, the student will be in a position to learn about electronics etc. too, thereby being able to specialize in mechatronics and to design drones and robotics. Hence the student

will be able to do some reverse engineering for their degree depending on what they wish to pursue. That is being made possible in the document.

Moreover, the first degree will be of four years, keeping with the trend all over the world. At present in India, BA and B.Com are of three years duration, whereas in advanced countries it is of four years, with a vast bouquet of courses. The reason is very simple. It is now widely believed that, while the depth of specialization is important, the breadth of knowledge is equally important, adding to general knowledge. If, therefore, you wish to cover general education as well as specialized education, then 3 years is too short a time. The basic aim is that the student must be able to pick up all that they wish, to design themselves into whatever they desire, which was completely lacking so far.

How far it would be possible to transform this in real terms, given the fact that we have 50,000 higher education institutions in the country, remains to be seen. While we have world class colleges, there are also sub-standard ones. With this kind of diversity, how far we will be able to meet such challenges, only time can tell.

The third major change is that the system of affiliated colleges will be done away with. In India at the moment, university education is still being imparted, not in the campus of the universities, but through affiliated colleges. The teaching is done in college and the university only conducts the examination and confers the degree. Teachers in the colleges



COVER INTERVIEW

have no control over the design of the syllabus or the design of the question paper. They have no control over the expected standards of evaluation, and the college just hands over the degree. It is universally agreed that this is the least desirable system of education, and other countries have given it up decades ago. The British gave it to us, while they themselves gave it up more than 50 years before we became independent. For 125 years we have continued this legacy. At the moment it exists probably only in India, Nepal, and a handful of countries, and nowhere else in the world. As per the new policy, by 2035 this will change. We are hopeful that we will get rid of a very undesirable system. World over the higher education system believes that unless the teacher is the custodian of the course, there cannot be a meritorious delivery of the program.

These are some salient features of the changes in the university system, a lot of flexibility will be permitted. A student will be able to study physics and philosophy, mathematics and music. We are thinking totally of diverse combinations. We believe that we will be able to meet the aspirations of the youth, in the way they wish to design themselves. Basic philosophy according to me is that 'you be the master of your career, be the designer of your life', and we will facilitate. I see that as a major change.

Q So, with the affiliated colleges system going, what will be the alternative?

There are several alternatives being suggested. One is that some very good colleges can be made autonomous, and will be able to award degrees. So far, the number of autonomous colleges in the country are very few, barely around 100, out of 50,000. The second alternative is to make a cluster of colleges and form a university. For example, some colleges that are close, not just in terms of

COVER INTERVIEW

geographical proximity, but in terms of subjects and specializations offered, can be combined. Or maybe a group that owns several colleges can turn them into one university. Hence colleges will be allowed to cluster themselves and award degrees. We are thinking in terms of three types of higher education institutions. One is research dominated institutions, that will do teaching but the dominant part will be research. Second is teaching dominated universities, where research will also be done, but teaching will be dominant. And third will be autonomous colleges that will be able to award degrees. So, the cluster of colleges, to begin with, will be the second level of colleges, but the policy also lays down that if you excel in research, you will be shifted from class 2 to class 1. That is how we propose to solve this problem.

Q How ready is the industry to accept this type of change in multidisciplinary studies?

Industry is more than ready to accept the change, because for many years it has been felt that the knowledge imparted is more bookish than practical, and industry needs skills. For example, industry doesnot want artificial intelligence only to be known to computer science engineers, they want it to be known to finance students, doctors, and media professionals. This will now be possible in such a policy framework. For instance, in the media there is a lot of dependence on IT, but in media courses IT is hardly taught. Industry is happy that there will be flexibility. Secondly, industry always wanted the system to go beyond the rote learning, as it wants people to be creative and innovative. The reason is very simple. Industry is changing so fast that we do not know what it will require 10 years hence. A study found that in a decade, 65% of our graduates will be working in a job, the title of which none of us knows at present. When we don't know, where do we scale it in. We will, therefore, have to teach the students to skill themselves. This is known as meta skill, how to skill oneself when the need arises. That will be the thrust and that is what industry wants. Even today, when the best of the industry recruits people, they donot give too much importance to what they have studied or know. They want to know if

a person will be able to adapt to the new situation by some imaginative skill, because that is the real risk. So I think industry is ready to accept the changes. Challenge is for the universities to change fast enough to come up to the expectations of the industry.

Q How has the role of the NBA evolved over the years and what changes does it need to bring in to keep aligned with the NEP 2020?

I believe that we are a member of the Washington accord, which is an MoU of 21 countries, including Canada, Australia, New Zealand, France, Malaysia, UK, etc. We have to follow the same standards for accreditation. Therefore, NBA had some concept of NEP already built into the system, like when we define what we expect from an engineering student, we emphasize much less on the subjects per se. We emphasize on twelve attributes that an engineer must have, for example, communication skills, ethics, understanding science, understanding society, professional communication, sustainability etc. The general attributes of an engineer were, therefore, highlighted much more.

India became a member of the Washington accord ten years ago. There is a review every six years, and last year we had a review. A very strong review is done. We had a team of three experts from Malaysia, Ireland and UK who reviewed our system. They went to two universities with board members for review, participated in meetings to see how the industry guides us, and on this basis submitted the report. The report was circulated to all the other 20 countries. They all voted for it. The requirement is for 2/3rd of the countries to vote in favour in order to remain a part of the accord. I am happy to say that in the case of India, all the countries voted for us. They said that India's system is robust and they accept it. Every graduate from an accredited institution, therefore, stands to be accepted in all these countries for potential employment.

To some extent we had brought in NEP much earlier. Now we will have to make some more changes when students take much more inter-disciplinary courses. So far we concentrated on the numbers of teachers and students in a department, but now with so much cross migration I think these will become more flexible. With new initiatives like academic bank of credit, students might change universities. We might have to even device a system that if a student moves from an unaccredited institution to an accredited institution, how much leeway can be given.We cannot expect a student to do 75% of the course from an unaccredited institution, and get the final degree from an accredited one by completing the remaining 25% there, taking advantage of the accreditation. All these norms will have to be made keeping in mind the changes. Our system will also have to be made more flexible. For example, instead of asking for all teachers in the mechanical engineering department to be mechanical engineers, if a higher number of students are taking up music or sports, there will have to be flexibility.

Q In terms of international education collaborations, how well is India currently poised and what steps need to be taken? How does the world perceive advancement in higher education in India and are the global universities ready to be a part of it, as is provisioned by the NEP?

At the moment, I am not satisfied with the internationalisation of higher education in India. Presently, it is more or less one way; our students are going to other countries and very few students of other countries are coming to us. That has to change. Bulk of the institutions are still not accredited, and our average perception of quality in the world is perceived to be low. There are some high-quality institutions, but mostly the perception is low, and I tend to agree with this. Unless we move the average quality up, the world will not perceive us as a centre of quality higher education institutions. Those such as All India Institute of Medical Sciences, IITs, JNU and Delhi University, are close to being the best institutions in their subjects, but when one counts the high-quality institutions from the 50,000, there will bebarely 500. As the world does not perceive our average higher education system very positively, we will need to work on it. The name of the game for internationalisation is quality.

COVER INTERVIEW

Quality comes at a cost. If we are able to give the same quality of education here in our institutions as in the United States, the expenditure will be about 40%. So there will be no reason for the student to go there if we give the same quality. We have to bring quality at an affordable cost, and India will be uniquely placed. We can give the quality because we have quality benchmarks, and our cost is low. So my thrust is affordable cost and good quality, which is feasible.

Why are highly-ranked foreign universities not keen to set up base in India? While we cannot allow them to fleece our students, we must permit them to make reasonable amount of money and repatriate it abroad. They would want to come to India because of the sheer number of students here, but we too need to be flexible. If they do come, it will raise the quality of our own institutions. Collaboration works in an atmosphere of give and take. This, I think, will happen over a period of time.

Personally, I feel knowledge is now universal. It does not matter too much where you study. Earlier it used to take years for knowledge to travel, now it takes seconds. Quality education can be provided nearer home, and that will be for the better. Further, COVID has created a situation where education nearer home will be preferable. The keyword will be creating quality at an affordable cost. Once we are able to do that, internationalisation will happen.

For NEP to be successful, teachers have to first forget what they know they have to teach; they have to learn what the student wants. It has to be other way around. In the process, we may not be perfect but that is fine. I don't have to impress my students about my knowledge; I have to turn my students into better citizens. We have to imbibe that aspect.

Q What are the best avenues for students seeking history/ culture/ tourism as an area for specialization or research?

I think avenues are increasing, but they are still far too little. Earlier, engineering and medicine were the only career options, as people used to think that if they could not get into either of these, they were doomed. That has changed, and I can take some credit for it, by the establishing of the Indraprastha University in Delhi, whereby we started numerous courses for the first time in the capital. While engineering and medical courses are important, they are not the only ones which the country needs. Vocational education was almost looked down upon, and parents and teachers were not in favour as well. Now with this policy, we are alloying combinations. I have submitted a paper about this. Every year, we have three lakh people competing in IAS exams for 100 posts. But then, you have to do BA or B.Sc courses, and nothing else. Now I have suggested that IAS does not require just these particular subjects; why cannot we have a BA which encompasses History, Geography and Tourism? This is a combination of academic and vocational subjects. Now if one is not able to make it to the IAS, and becomes a tourist

guide, one will be among the best in the country because of knowledge of history and geography. So we have to design things in such a way that we do not have youth miss out on opportunities, and also expand the opportunities in other ways. For example, why can B.Sc not have chemistry, pathology and medical lab technology as well? If one is a medical lab technician, by understanding chemistry one will be able to do much better. We, therefore, have to design several combinations, of traditional with vocational, or science with arts. I believe these opportunities will open up, and we will be able to synthesise the wishes of students and parents in the new policy. What the child aspires to be, and what degree the parents want him to achieve, will get a point of convergence too.

Moreover, our folk music, dance forms, languages, literature, diversity of flora and fauna in the country, are all great things, but they were not studied because a higher status was accorded to engineering and medicine. Now there is a possibility that along with the sciences, one can take up a course in agriculture or environmental study. That makes for a very good combination. Once there is better education, economics will be taken care of.

I want to approach economics via growth in education and culture. If everyone becomes more competent, the country will automatically become richer.

Engineers must be able to serve the society. Ultimately, our power and food requirementsare increasing every day. The sustainability requirement is increasing; the carbon footprint has to go down. For all this, engineers are needed; but you have to make the right kind of engineers who understand these things and produce them at an affordable cost. At the moment the situation is a bit dire for engineering education.

Q India is making progress in the IT sector as a service provider. What is the scope of becoming a manufacturer and attaining patents, and thus being able to target a bigger market?

As far as IT services are concerned, we are number one in world, to a large extent. We have got the logic and are performing well. But as far as products are concerned, we were lagging behind, though we have made up to some extent. There are reasons for this. Firstly, we did not have policies that encourage this. Products have a lot of developmental cost, and unless we increase the volume and scale, the product cost becomes prohibitive. What we had to do was to estimate the products that can be consumed in bulk, or be marketed around the globe, and produce those. That kind of policy thought was missing. For example, VLSI chips are a very costly phenomenon. But if there is a market for only 100 chips, one is headed for bankruptcy. There has to be a market for one million chips. That is possible by policy intervention.

Things are improving now because of offshore; onsite things are changing. But we have to do a lot more. This is technology, knowledge, and planning put together to see that we will beat the world in all these fields. We cannot beat the world in everything. We have to strategically decide our core area, our niche area, and what we can produce in billions. Though I see change, I agree it should have been faster. We are already making some mobile phones in India, as well as chips. We are, thus, on the right track.

Q However, the acceptability and competitiveness of the products manufactured here has good scope for improvement. How do you suggest that we fill that gap?

Quality is also a matter of perception. I have published over 150 papers on quality and I feel we not only have to make quality products, but also change the perception of the world for our products. After all, if the USA took all the software services from our engineers, it means they were confident of our quality. But quality again comes at a cost. First you have to generate the volume so that the cost can be recovered. We have quality capability, but the world's perception has to be changed, our volume will have to change. Our capacity is good enough for any benchmark across the world. As regards the education system, in the top-ranking universities globally, 20% of the faculty are from India. These professors had their education right here in India.

So quality is possible, but we never consciously worked for it, because whatever we produced, even low quality, would sell. We have to create a situation where low quality will be doomed and high quality will win the prize. We have to strategically work on this. But technically we are capable of giving quality, of that I am certain.

Q Tell us about the research facilities for students in the Government institutes, especially the libraries and incubation cells? Are they sufficient for supporting the advanced research work by the students?

Well, our research infrastructure in some areas has improved by a long way. For example, in space research we are comparing with the best. I was one of the designers of PSLV with ISRO. In defence and atomic energy, we have done exceptionally well. But in general, the facilities are not satisfactory. For one, our research expenditure has been far too low. You need infrastructure for research and we have not been able to invest in it, apart from a few institutions. We have to take care of that.

Secondly, in other countries, industry has heavily invested in research. In India, industry has invested very little, and we are highly dependent upon the government. We expect that the onus is only on the government to provide facilities. So we did not invest on research. Abroad, many of the companies are run by professors of universities. In India, we never allowed professors to earn well, except over the last few years. Research expenditure and infrastructure have to improve. Psychologically too, we somehow believed that knowledge should not be monetised. So patenting was not in our blood, and we never focused on it. It was a blatant misplaced philosophy. But now we are improving, and the department of science and technology are making very conscious efforts for facilitating patenting and providing the infrastructure. But the budget allocation for research has to increase.

The new Science and Technology Policy is on the anvil. I think that part will also be taken care of soon enough. It will be a long-term projection. You cannot think about the next election and make a policy. Policies need a long-term perspective, and

that has to be kept in mind. You invest in research, and in five years you will not even know whether it has yielded any returns. Rather, you may feel that it is a waste of money. So, we have to believe in our system and put in our best efforts, as there is no scope to be careless about it. Then I am sure we will be able to deliver.

The number of research publications in this country has increased significantly, but once again, quality publications are far too few. So, while we are competing in terms of quantity fast enough, we are not competing in quality at the same pace. We will have to reduce the emphasis on quantity and increase the focus on quality. A policy shift will also have to come about. Industry will also feel that if they invest in research and give money to a university to establish a research lab, the graduate from there will be more beneficial to them. That mind-set will have to come about. It is happening but happening all too slowly.

Knowledge is now universal. It does not matter too much where you study. Earlier it used to take years for knowledge to travel, now it takes seconds. Quality education can be provided nearer home, and that will be for the better. Further, COVID has created a situation where education nearer home will be preferable. The keyword will be creating quality at an affordable cost. Once we are able to do that, internationalisation will happen.

Q Is there a scope for Indian Universities to earn substantial income through research funding and patents?

First of all, they have a scope to earn, they should earn. But I believe focusing too much on earning may also not be a desirable thing. First we have to come to a level of quality where industry is ready to invest. At the moment we want industry to invest, but industry asks what there is to invest in? In a democracy, good quality education, health and delivery of justice are the responsibility of the state. Once we come up to a certain quality, then industry will be ready to invest.

Even foreign industry might invest here, because our manpower costs much less. Imagine, some industry setting up a lab in a US university, as compared to an Indian university! Initial expenditure is the same but the worker cost will be one-third here. So they will be much happier to do it here. But we have to give them the confidence that we are capable of using this infrastructure with efficacy. Unless they have that belief, they will not invest. It is, therefore, a bit of a chicken and egg situation. Money will come provided we have the quality. We tend to say that quality will come if we have the money. I think we will have to take the first step of spending, getting the right quality, and then money will come.

Q Recently there was some news about low admission to engineering courses. Do you see a shift in the trend of admission pertaining to courses that students want to take up?

We had grossly over-rated engineering vis-a-vis other courses. I see no reason why elitist status should go only to engineering institutions. Looking at the world-wide ranking of universities, we find only in India that out of the first 10 ranks, 8 are engineering institutions. It doesnot happen in the US, France, Germany or England, only in India.

Engineering institutions are much coveted, we spent on them, and built them. The number increased rapidly, but with low quality. Now applicants feel why they should pay such heavy fees when the quality of education is not good and employment is not likely to be attractive? It is a mismatch between the cost of education and its quality. I have a simple point. Seven to eight lakh students appear for the JEE exams. So when we have less than 7 lakh seats, why are seats vacant? That means though students want to be engineers, they want to do so from the right kind of institutions. Engineering has not lost its charm. But to provide the desired quality at the fees charged has become an issue. Parents feel that if their ward will get a job of say Rs. 15,000 per month, why not get them to do a BA or B.Sc? Why push for engineering and spend Rs. 10 lakhs? That's the serious problem, quality of education. I have been able to accredit less than 20% of the engineering colleges in the country, and I have not rejected many of them. They are not confident enough to apply for accreditation. That means they know that they are below par. Hence if we increase the quality of engineering education, things will get better.

Also, we have to diversify engineering education. This state of specialisation, that if you know electrical engineering, you know not much else, and as a matter of fact, in the process of providing specialisation, we forgot to make them engineers. I think this building has to be a pyramid. First, you make a good human being, then a good engineer, then a good mechanical engineer, and then a good air-conditioning engineer. We made a good air-condition engineer, with a reasonable mechanical engineer, forgetting whether he has become a good engineer, or whether he is a good human being. We were thus trying to make second and third storey of a house, without the foundation and the first floor. That is my diagnosis. If we take care of this, engineering will pick up.

Engineers must be able to serve the society. Ultimately, our power and food requirements are increasing every day. The sustainability requirement is increasing; the carbon footprint has to go down. For all this, engineers are needed; but you have to make the right kind of engineers who understand these things and produce them at an affordable cost. At the moment the situation is a bit dire for engineering education.

Q Lastly, you have had a long and exciting journey. Do share something that you remember from your visits to other countries as a professor.

Primarily, I am a teacher. After getting first rank in engineering, I opted to be a teacher, which was very rare. I appeared for an interview, where my own head of department was an expert panellist, and I was rejected. Later, when I asked my head of department, he said that everybody wanted me to be taken in, but he said Iwould do much better elsewhere other than being a teacher. Anyway, I loved being a teacher, and I am very happy about it. When I became the youngest professor in the world, that very professor came to my house, to say that I was evaluating myself correctly, but they were evaluating me wrong. So that is a compliment.

I believe teaching or professorship is a wonderful profession, because one can transform some lives. I have been able to completely transform perhaps half a dozen students. That is the real crux of life. Comparing the Indian system with the 20 to 25 countries across the world where I have travelled, I found that the focus on the quality of education was much better there. The inter-disciplinarian application was much more. In our country, there is still a lot of rote learning and emphasis on the examination system. Once, when I set the question paper, one of the brightest students was perspiring. I called him after the exam and asked what the matter was. He said, "Sir, for the first time I have seen an examination paper where we had to think in the hall. Otherwise, we were always just pouring out automatically what we had learnt by heart. We were not used to this." That was a prominent difference between other countries and our country, barring some very good institutions here. As a professor I think that teachers will have to be very innovative and creative, only then can students too be so. Sometimes students are brilliant but we suppress them. Suppressing the creativity of students is a serious error that teachers in this country have been doing for quite some time. That has to be undone.

I was reading that Dr. C V Raman was very fond of the musical instrument Mridangam. In one of his researches he stated that if a Mridangamis made of jackfruit wood, it is the best. Now, if a physicist comes to this conclusion, then that research has a lot of credibility, about the vibrations that makes it the best. That kind of inter-disciplinary research has to come about. My experience in interacting with the industry has been that it loves professors who can deliver results, solve their problems, be useful to them. Why should we expect otherwise? I have been consulted by some of the best in the industry and I am delighted with it.

As a professor, I believe, we have to first imbibe NEP. For NEP to be successful, teachers have to first forget what they know they have to teach; they have to learn what the student wants. It has to be other way around. In the process, we may not be perfect but that is fine. I don't have to impress my students about my knowledge; I have to turn my students into better citizens. We have to imbibe that aspect.

Lastly, I must say that the kind of affection I get from all the students I have taught, makes me extremely joyous. I will narrate an incident. On one of my trips to San Jose, there were about 50 of my students there. When one of them learnt about my presence, I promised to spend a whole day with them, and asked him to inform all the others. When I went to his house, there were only two students. I said, "There are 50 students in the city, how is it that only two of you are here?" They smiled and said that they didnot want my 24 hours to be shared with 50 of them. They wanted only two to take advantage of this limited time. This says a lot. I think if you wish to inculcate that kind of bond with your students, then this country has a great future. I have seen students as well as teachers like this. I am a hard-core optimist and I believe that this can happen. We have to take care of our universities. Pay scales are reasonably good now. We have to upgrade in terms of infrastructure and rules.

Now with online teaching, I think the best teachers will be recognised automatically. If one is not forced to study a course only from one's university, and is free to study anywhere, then the best teachers will be gain recognition, accepted and in demand. I think in a decade we may have a system where the professors work in a university, in the manner doctors work in hospitals. They are not employees of the hospital, but visit various hospitals as consultants. If I am a good teacher, every university will invite me. Once that kind of model is adopted, students would own the teacher and teachers would own the students. If the students believe you are their well-wisher, then the teaching profession is very satisfying. Everything will follow from there, rather than just from knowledge of the subject.The world over, students are very open with their teachers. The fear psychosis must dissipate and working togetherness must be imbibed. If that happens, I shall be most happy, and certainly things will improve by a long way. EP

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Dr. Deependra Kumar Jha

THE MANTRA FOR SUCCESS IS LIFELONG LEARNING

DR. DEEPENDRA KUMAR JHA
VICE CHANCELLOR, ADAMAS UNIVERSITY, KOLKATA

Deependra Kumar Jha, Vice Chancellor, Adamas University, took over the reigns of the University in West Bengal at a time when the pandemic hit India and the world. Over the past year-and-a-half, he has helped the institution take rapid and bold strides towards transforming the educational systems and methods. He has had valuable industry exposure, as well as research experience. A strong believer in the power of technology, Dr. Jha feels that in the future, literacy will be real only if people possess 'IT Literacy', and that hybrid education is the new normal. We present his radical views about the NEP, future of education and more.

People must take their faith out of institutions and put it back into education, into learning. It is a bitter pill to swallow but we have to unlearn this approach. The world is ruthless, and we must learn to learn again. Our flexibility is what makes us successful. If you are rigid, the future is obsolete for you.

In the future, the biggest asset will be the hunger for knowledge, adaptability, the ease with which one embraces change. Hold on to your curiosity. The mantra for success is lifelong learning.

How did you decide to be a part of academic administration, instead of opting for corporate opportunities in the power sector?

I have worked with industry as well as academia. But when it comes to making a choice, I have always chosen academia. People yearn for revolution, looking for a language that animates where the tongue falters. I have always been a dreamer, a writer, and I have always wanted to witness this metamorphosis. There are moments of uncertainty, layers of syntax and semantics, days and hours, names forgotten, salvaged and shed, but I still believe this is the way to uplift society. If we demand change, it comes through education, through exposure, through enlightenment, through collaboration. It comes through understanding, diverse mind-set and awareness.

When I think of tomorrow, I often think this is a world I have helped build, and I want to be proud of it. This is the way I am playing my part, and maybe when the future revisits the past, they bring about revolutions we have waited for.

Tell us about your vision for the growth of Adamas University.

Adamas University aims to become an internationally reputed institution of higher learning through excellence in teaching, research, and innovation. Students have always been our priority. We have re-structured the organisation to optimise efficiency through decentralisation. We empower the faculty, staff, and administration and allow them to act as entrepreneurs for the benefit of all the stakeholders. Long range academic plans are developed, leading to institutionalising innovation and holistic student experience.

Research and the production of knowledge becomes innovation once the knowledge is applied in a new and novel manner to create a new outcome. Universities should be as rigorous in their approach and strategies to innovation as they are to their research and teaching. We need to focus on research in active collaboration with Industry to devise impactful innovative solutions. For example, the Oxford University and AstraZeneca collaboration resulted in a successful Covid-19 vaccine.

We would like to improve both the quantity and the quality of research by faculty and students, bringing in a better research culture. An Internal Quality Assurance Framework (IQAF) has been developed for benchmarking and continuous improvement. Adamas would also like to reach out to the community in general and bring about a sustainable improvement to lives. Adamas will be one of the most sought-after universities in the time to come.

Do you believe that the goals of the NEP 2020 are 100% achievable? How are you looking to implement the changes?

NEP-2020 gives a roadmap to future education system in India and is revolutionary in many ways. It is about holistic development of students through a flexible, innovative, multi-disciplinary and technology-driven learner-centric education. It has some ambitious goals like establishing at least one large multi-disciplinary institution in or near every district by 2030 and increasing Gross Enrolment Ratio in higher education to 50% by 2035, among others. Academic Bank of Credits (ABC) is a path-breaking concept that will challenge the education providers and compel them to transform into ambitious, futuristic, and student-centric institutions.

While NEP-2020 envisions great things to reform the education system, its implementation holds the key. The challenges are many, from infrastructure augmentation to mind-set change. We need 21st century teachers who understand the new generation of learners and ever-evolving technological interventions.

As a new-age institution, Adamas University is committed to implementing the vision of NEP-2020. In fact many of our systems and processes are already in line with the vision of NEP-2020. We follow Outcome-based Education System, where our curriculum, pedagogy and assessment are articulated, based on specific outcomes. A student, irrespective of their chosen discipline, will be part of inter-disciplinary project-based learning, which is unique. A bouquet of many futuristic undergraduate specialised programs like AI-ML, Cyber Forensics, Blockchain technology etc. have been introduced. We have also introduced a wide range of 'Minors', microbiology to music. We aim to build well-rounded human beings who will be lifelong learners rather than just industry-ready professionals. Every Adamas student has to essentially carry out community service as a part of the curriculum. The Centre for Lifelong Learning (CLL) works on holistic development of students with 21st century skillsets.

As a researcher who has studied and travelled globally, how do you compare the research facilities in India with those in other countries?

As with many other issues, it is not so much about the facilities as it is about the mind-set. The curriculum and pedagogy at most of the reputed foreign universities follow a practical approach in education, and encourage fresh research other than what has already been discovered. In India we have followed a theoretical approach and rely heavily on past research to assimilate the future. The scenario has changed a bit lately though. Indian Universities, both private and public, are now creating a robust research ecosystem and encouraging faculty and students to undertake quality research.

The problem is that our research mostly stops at the point of invention, that is, discovery of a new idea, rather than innovation which is application of the new idea for a new outcome. Research and the production of knowledge becomes innovation once the knowledge is applied in a new and novel manner to create a new outcome. Universities should be as rigorous in their approach and strategies to innovation as they are to their research and teaching. We need to focus on research in active collaboration with Industry to devise impactful innovative solutions. For example, the Oxford University and AstraZeneca collaboration resulted in a successful Covid-19 vaccine.

Is the online mode of education here to stay or will we go back to the traditional classrooms?

There is no going back. The pandemic is the end of a mile-long sentence. If we are lucky, the end of the sentence is where we

might begin. COVID-19 is a cornerstone; as a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is largely undertaken remotely and on digital platforms.

Online learning may have been found useful, but it has also exposed some of our shortcomings. Not everyone has access to online education. In remote areas, many people donot own smart phones or gadgets. Internet connectivity remains a challenge. There is the issue of meaningful collaboration, and classroom engagement and interaction. But I cannot say it is without merits, we cannot undo the concept of classrooms, but our choices are limited.

With continuous technological advancements, this system is here to stay. Blended learning is the way forward.

Anything specific you want people to know about Adamas University?

At Adamas University, innovation is at the core. It has a truly global outlook, and is still rooted in the Indian ethos. A 120-acre lush-green campus is always buzzing with energy; great sporting facilities and infrastructure, and endless co-curricular activities. We boast of a number of state, national and international-level sportspersons among students of Adamas. We ensure a quality of life that can rival many international universities. We are among select Indian universities with QS E-LEAD certification awarded for excellence in online blended teaching learning. Recently QS I-Gauge has awarded us Platinum badge for excellence in teaching and learning, and Diamond badges for employability and social responsibility respectively. We are the first Indian University to be rated Diamond for excellence in Academic Development by QS I-Gauge.

The undergraduate engineering students at Adamas University have an opportunity of doing a 'Diploma in Management' within four years of their study period, a unique provision having no parallel in this part of the world. We work in close association with industry to co-design, co-deliver and co-certify our program offerings. We have devised a unique way of measuring all-round development index of students through ACE (Adamas Comprehensive Excellence) score that includes academic performance, employability skills and co/extra-curricular achievements. We focus on a well-designed 3-E approach for students – employability, exam pathways and entrepreneurship. The Centre for Lifelong Learning ensures holistic development of our graduates through personality enhancement sessions, and programs like campus-to-corporate, and foreign language training.

The preparation for competitive exams is integrated in our offerings in a unique way, thanks to the 36-year-old legacy of the RICE Education which has trained over 150,000 successful candidates who are currently working in various central and state government positions.

What is your advice for students to help them prepare for a bright career?

The idea of a 'bright career' is very dynamic and multi-faceted.Of course there is the need for context and perspective. It baffles me when people fear change.They are just scared that something will last longer than they can love it. We have seen time and again that there is no one-solution-fits-all. Everyday we touch the world as an echo of who we were. We must believe, though, that in this uncertainty there is scope for infinite opportunities.

People must take their faith out of institutions and put it back into education, into learning. It is a bitter pill to swallow but we have to unlearn this approach.The world is ruthless, and we must learn to learn again. Our flexibility is what makes us successful. If you are rigid, the future is obsolete for you. There is no better example than this pandemic; look how fast we have built around the ashes. Sometimes we have to side-step ourselves to move forward.

In the future, the biggest asset will be the hunger for knowledge, adaptability, the ease with which one embraces change. Hold on to your curiosity. The mantra for success is lifelong learning. EP

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Dr. DNS Kumar
Vice Chancellor
Sushant University, Gurugram

You have worked for many years, and been associated with various institutions, in Bangalore. Do you perceive any difference in the working culture and educational aspirations between the Silicon Valley of India (Bangalore) and the Millennium City (Gurugram)?

I don't see much, because in Silicon Valley also, most of the students are from the NCR region. In terms of intellectual resources, which an educational institution requires, across India different sects of people are there, with a mix and match of cultures/ diversity.

How mature is the Indian corporate sector in terms of being financially organised and transparent?

As the Hon'ble Prime Minister Mr. Narendra Modi has appealed to the public to be Aatmanirbhar, so is applicable to corporates and corporates are gearing up well. The Government of India through its strategic developmental perspectives is building a conducive and vibrant eco-system in terms of package, concession, divestment, etc to make corporate more strong financially and otherwise too. Whether it is manufacturing, information technology, insurance, banking, or start-ups, the industrial sector is gearing up well. I hope and as a financial consultant, I see a good amount of capital formation is expected in near future for re-investment, growth, and development. If you look at the transparency aspect, digitalization of our activities, system-driven approaches are building a minimum government and maximum governance. An example is the GST collection.

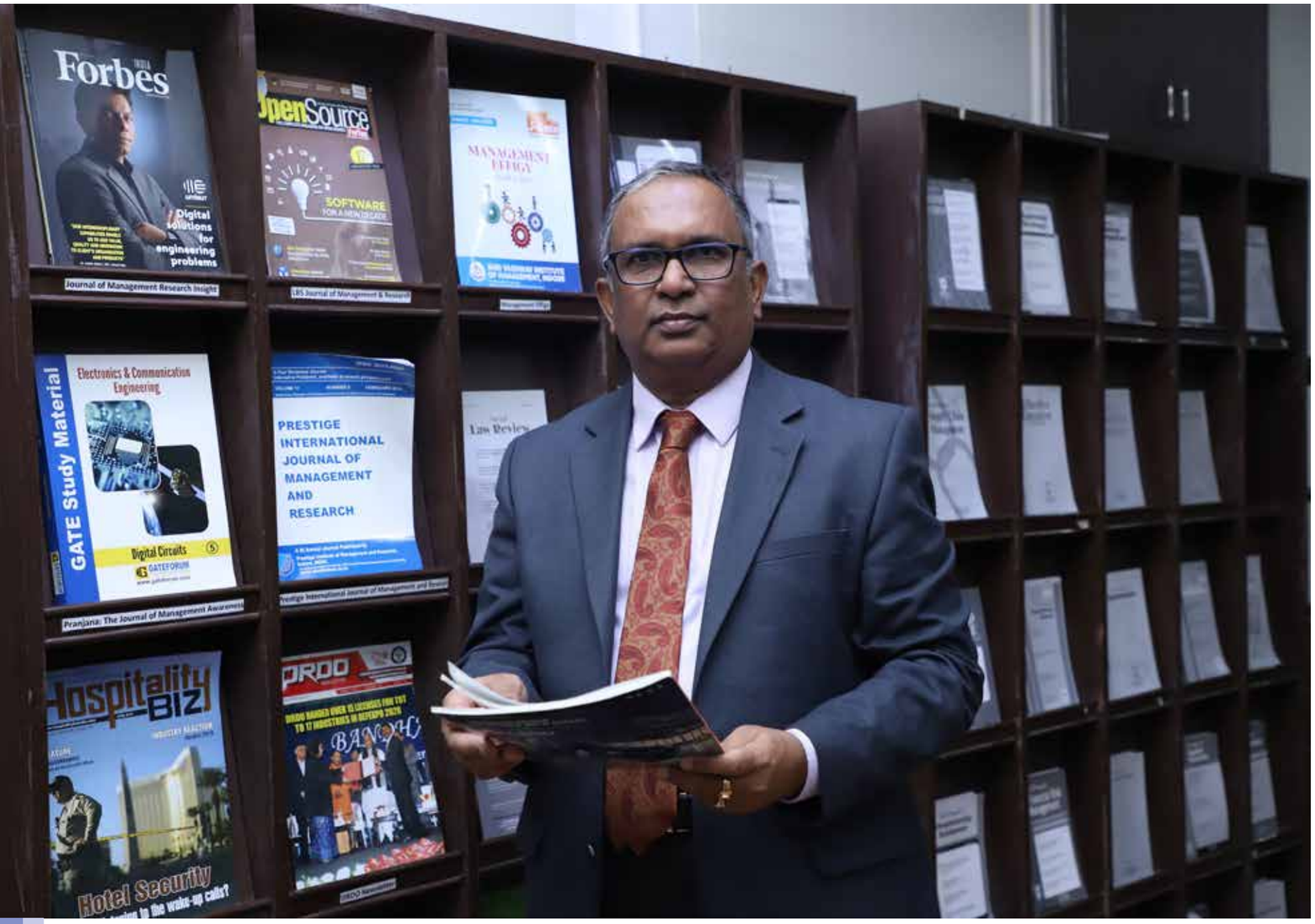
What steps have you taken towards building a connection between the industry and academia?

At Sushant University, Gurugram we have 39 programs across 8 schools, and all our programs are applied one. These programs warrant a good amount of hands-on experience and practice. All the programs are tied up with one or the other top-notch corporate house/industry. These players in our programs actively participate and pitch in for the deliberation, discussion, articulation, and experimentation with our students and faculty members

Today, the challenge before the higher education institutions is, to bridge the so-called discussion that is there, the gap between academia and the industry. What the institutions need to do is to get engaged with as much experiential learning as possible. In that process, the engagement of students to create newer experiences is very important. And from where it can come? To some extent, it can come from educational institutions, but for the major part, it can be created only in the corporate sector, where the infrastructure and equipment are there. Also, people who are adept at using those technologies and equipment are there.

Keeping note of that, the Siemens company approached us, that they want to have a tie-up. When our corporate resources center people were excited to take it up, we wanted to understand what is the reason, why they want to get into this tie-up in the field of mechanical engineering. They said that we manufacture the machines that we provide to our customers, but how to use these machines, the existing employee base doesn't have that competency. Therefore, we want to establish in Sushant Univ. Siemens center for Excellence. And we want to bring in the machinery, how these are used in the corporate world, that training and experience we want to provide to your students so that employability skills are ensured in them. This is one example, and the same thing must happen in design, architecture, and maybe law also. So that is how the bridge between academia and industry should happen.

How much do you think will be the impact of the new education policy on the way the industry employs and trains new graduates?



That's really a blessing for the education sector. Headed by the renowned scientist and educationist, Dr. Kasturirangan. The NEP has spelled out a new approach towards education, which is a relevant, current, and contemporary one. All these years, we used to talk about western education only, but who has created western education also? Most of the Indians who have gone there have created it. Now we have an opportunity coupled with challenges to bridge the gap between industry and academia. NEP has extended an opportunity to make education along with knowledge the skills which are required to practice in the Job/Career/Profession.

Academic Bank of Credit, Multi-disciplinary approach of education, Certificate programs, diplomas, and Honors programs will strengthen the process of learning and enhance the skill, attitude, and competency sets among the learners. National Research Foundation (NRF) when executed in its true spirit will bring the new and applied knowledge which can be put to use and practiced. NEP has opened the learning, participation, contribution process to all people from different disciplines to contribute. May be from industry, retired people, bureaucrats, etc. Everyone can participate in an educational drive.

You have worked on several projects related to

social upliftment, either with the corporate sector or the government. What's the scope for students working fruitfully in these areas as far as financial planning, management, and reporting are concerned?

The governmental machinery that we have at the Government level, at the central or state, is a well-thought and futuristic one to support the educational aspects too. But unfortunately, down the line of machinery and along with educational institutions, the benefit of learning through projects is not made available to learners. At the same time, very few projects are initiated and executed in the interest of beneficiaries. Here, educational institutions can play a good role to help the corporate, government, and get helped in learning and delivery part of education.

For example, every governmental department has research, survey, and fellowship scheme which are not known to educational institutions and not made known also. It may be in the hosiery, textile, leather, gems and jewelry, agriculture, and horticulture sectors, etc. educational institutions can do the research, build the feasibility report, prepare the detailed project report and help the government in policy formulation and corporate sectors in execution. Once the students come to know, they will be able to float their own startup companies and entrepreneurship too.

How has the pandemic impacted the academic journey of university students?

As far as Sushant University, Gurugram is concerned, not much. In fact, I would rather say that it gave an opportunity to explore our hidden skills and competencies. We provided multiple resources to our students in the form of digital platforms, digital resources, extended webinar/conference/seminar, and involvement of all stakeholders in our deliverables and so on. Juries, practicals, etc were carried out by our faculty from their home. These days students are well informed, as far as the technology used is concerned. The only challenge that we had was with the senior and aged faculty members, who took some time for gearing up to the technology usage, as far as deliverables are concerned. Otherwise, we have given a well professional touch to all our endeavors. In this part of the NCR, I can proudly say that Sushant University is the university that took 100% online education, examination, results, convocation, admissions, and so on. Fortunately, during the pandemic, our admissions were better than otherwise.

What is your advice for students wanting to make a career in the field of valuation and Financial Forensics?

It is an emerging and upcoming area. With the Insolvency and Bankruptcy Board of India (IBBI) wherein valuations, reconstruction of businesses, reorganization of the businesses are the order of the day and profession. The students can do some certificate courses, not only from India but also from abroad. There are international courses like the Certified Valuator and Analyst (CVA), Master Analyst in Forensic Finance(MAFF), etc., Students will get an opportunity and make a professional career not only within the country but internationally too.

What are your top 3 goals for the growth of Sushant University?

i) Value-based education

ii) Engagement of learners in practical aspects and for certificate courses and diplomas programs, and

iii) Working along with all stakeholders

What should the students who are coming to take admission here expect from Sushant University?

Today, students are well informed and know what should be the learning output from the programs they join. Basically, students joining Sushant University are from professional/industrial/working-class family backgrounds.

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Rajiv Williams

The 2030 AGENDA for SUSTAINABLE DEVELOPMENT

adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity, and focuses on 17 sustainable development goals, which was a shift from the MDGs which were there earlier.

Rajiv Williams
Head, CSR at Jindal Stainless Steel

It is indeed a unique challenge to be part of an industry that is infamous for being a major pollutant, and carrying the onus of creating a better environment through Corporate Social Responsibility actions. However, Mr. Rajiv Williams, Corporate Head, CSR, Jindal Stainless Steel, has taken on the challenge with poise, and is committed to meeting Sustainable Development Goals. He has initiated a number of measures for social change, and helped the company partner with global and local bodies engaged in mitigating carbon di-oxide emissions and reducing the consumption of natural resources. In a conversation with the Education Post, he speaks about the steps that have helped JSL cut down their carbon footprint and create a greener habitat.

How successfully has the corporate sector fulfilled the goal of sustainable development in India?

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity and focuses on 17 sustainable development goals, shifting from the MDGs. These goals had the target of keeping the global temperature rise for this century at less than 2 degrees Celsius, which was revised to 1.5 degrees. So, with that aim in mind, they came up with several projects and sustainable development mechanisms and linked them with the 17 SDGs which were articulated. Initially, there were these 17 goals and 169 targets that revolved around these goals. Many events have been held around them, a lot of capacity building and connections have taken place, to make people understand these goals. Like in the MDGs, the number one aim here is poverty alleviation. The second is about zero hunger, the third is about health issues, the fourth is about free education, SDG 5 is about gender equality, sixth is about clean water and sanitation, 11th is sustainable cities, and 13th is about climate change, which is a big issue and gaining center stage. The last one, about partnerships, is also very important. With these 17 goals and 169 targets to be achieved, the corporations have to get engaged, in trying to facilitate the process, because we are signatories, we are part of the United Nations. It is thus, beholden on us to leverage our resources and ensure that we, as a developing country, have to get organized into global partnerships, recognizing each other's strengths and weaknesses and improve upon our health and education systems.

Despite the 17 goals that we have got, there is a lot of interdependence. Poverty alleviation is also related to health, education, gender equality. So, corporations have been sensitized towards this and they are doing pioneering work, trying to garner support from each other through the industry platforms, like the CII, FICCI, ASSOCHAM, and the Chamber of Commerce. They are trying to address collectively the actions that are taken. There's a national action plan and there are indicators of how you are measuring the impact of whichever SDG you are supporting through your CSR initiatives and business responsibility initiatives can be mapped. In our case, we have mapped our SDGs through a digital platform. So, if it has to do with the environment, we straightaway click on what all indicators have come on the environment piece and see how much mitigation, strategies have been adopted on climate change.

What were the challenges you faced while carrying out the perception management roles associated with the Indian army?

When we are dealing with media, on behalf of the armed forces, there must be an equal opportunity, meaning that there must be no bias towards vernacular media, or local stringers who are there, or the national media. National media gets more credits because you are located in the national capital or big cities. So as far as briefings are concerned, they are more concentrated. But we do not give preference to one media channel vis a vis the second channel, by propping up some of them and not allowing others. So equal opportunity is very important. The second thing is that it's all right when we talk to them over here. But when you make them go and physically see what is happening on the ground, and move them through the headquarters and also move to the combat positions and locations, as we did in Kargil, that's the time when they can give you the real story, sitting in your bedroom. It was the first televised war and fortunately, I was handling the media at that time. Why did it weigh in our favour? Of course, the action was on the ground, but if people did not know what is happening on the ground, how would you believe it? So, the media, especially the electronic media, was taken right through the posts, right up front, and they could see for themselves what was happening. So, there were special correspondents, who saw what happened, came back, and put stories. The agencies like Reuters, APIs, national and international media, had the opportunity to go and see on the ground.

So many books came out after Kargil. It's first-hand information. Some people like Harinder Baweja covered the war from both sides of the border. So, you give them an opportunity, to make it real-time reporting, rather than talking about a situation where they are telling stories without being on the ground.

In today's context when we talk of the corporate sector, the third-party impact assessment is an independent type of story which an assessor writes on the actual project. So, these are real-time opportunities that we give them through interviews, etc. Also, we ensured proper coordination between different ministries, whether it was the ministry of external affairs or home affairs or the other ministries that were doing stories on economic development and growth, we had to make sure that we mix and match because everybody wants their story to come out. That's what we were doing in the army, trying to balance out so that there's one single voice.

As a part of an industry that has a high carbon footprint, how do you plan the steps towards sustainability?

On the point of carbon footprint, besides undertaking some CSR projects, like tree plantation drive, water mitigation strategies to include water harvesting, engaging with farmers on climate-resilient agricultural practices, sustainable parks, and other initiatives, we have been focusing on mitigating strategies for reduction of carbon-dioxide emissions. We also have been engaged in lowering our carbon footprint by working on climate-adaptive technology. We have invested a lot of money in high technology manufacturing processes. Western countries have very expensive technologies. But Jindal Stainless Steel limited, in both the projects in Hissar and Orissa, has invested a large amount of money. We are taking initiative, but the support must also come from the Government. Some sort of support is required to encourage corporates to move forward and change the processes so that they mitigate this problem of carbon-di-oxide emissions.

Developing countries are working towards creating a funding mechanism. The developed countries have said they will provide it. But I don't see it on the ground. Where are those funding mechanisms that have come into place? Now the COP26 is going to take place in Glasgow by the end of the year and is going to be reaching out as far as the golden objective of climate change 2030 agenda is concerned. But the visible act of raising the assurance bar of seeing it happen on the ground and capturing the temperature increase to 1.5 degrees, by 2030, is something which all of us have to work on together.

India is not so much a polluting country as the western world. Our per capita pollution may

be the lowest, but the total quantity of carbon dioxide emission is second only to China. And we are very fast approaching a figure which will cross China's benchmark. We as Jindal Stainless Limited, have taken some steps. We have worked on initiatives related to energy-efficient projects and process optimization. We have got certified with ISO 5001 standards, which indicates our commitment towards energy efficiency agenda. There are some steps of energy conservation. One is taking up various very high-energy efficient processes, which has accrued a saving of approx. 6500 tonnes carbon-di-oxide reduction in emissions in 2019 – 2020. That's a significant amount.

And for the fuel conservation process, we are working on reducing our fuel contents that emit carbon-di-oxide. We will do it by switching over to alternative sources of energy. One of the processes that we have adopted is the heat recovery boilers. The coke oven gas which used to be flared up in the open creating that kind of pollution in the environment has changed with the insulation of the gas purification units. There is a system that we have adopted as far as direct charging of liquid ferrochrome in electric arc furnaces, and up-gradation of the LED lights in the complete plant system has also the import of green energy, to the tune of almost 18986 megawatts. We have changed our fuel systems and this has also addressed the issue. These are some processes, besides the bio-fuels and the boilers, which are blended with the coal-fired boilers to mitigate this problem.

It's important to carry on periodic energy audits, water audits, and regular replacement of the old systems that we have got. This is an ongoing process, as we see what we have achieved with these new processes in place, and then we report.

All this costs a lot of money. There is a requirement for the fund that has been created by the developing countries, and through the Government of India, the mechanism must be found to make these funds available to the corporates. We have got to ensure that the MSME sector, which is a huge polluting source. They don't know how to overcome the problem, and their profit margins are much lower. They need support.

> **There is change in the rainfall, and requirement for water to be preserved. So, we do conservation of water through the various technologies which are available of growing some of these crops.**

Tell us about the concept of the Carbon Development Mechanism.

The idea of CDMs was to assist the developing countries in sustainable development and contribute to the ultimate objectives of the convention. It was something to do with climate change, and attain the objectives which have been listed in the 17 goals. Now, you must be registered for a CDM project, and receive the approval of the government. We also have got one UNFCCC (United Nations Framework Convention on Climate Change) project in Orissa, which was to do with the recovery of gases and converting that into heat generation for the furnaces. And the UNFCCC has got three flexible mechanisms, defined in the Kyoto protocol, and it has been very clearly articulated in article 12 of the protocol, which intends to meet two objectives. One was to assist the developing nations in achieving the SDGs and reduce their carbon footprints. And second, was to assist the industrialized nations in achieving compliance with emission reductions.

The Kyoto Protocol entered into force in 2005, and the detailed rules for the implementation of the protocols were adopted in COP 7 in Marrakech in 2001. Its first commencement period started in 2008 and ended in 2012. So, Kyoto protocol- Phase 1, was from 2005 to 2012, gave the target of cutting the emission to 5%. And in Phase 2, 2013 to 2020, it gave the target of cutting the emission to at least 18% by the industrialized countries. This development needs the government's approval if you want to apply as a project for funding seed money from the UNFCCC.

Many bonds are coming, like Carbon Bonds. Then there is the Carbon Exchange, in which the countries can exchange their mitigations and reduction of carbon-dioxide emissions, with some other players in the field who have very high emission results. So, you can buy those bonds and the world could be protected. Since the collective emission by India is very high, some of our bonds can be bought by the western countries, and that gives an opportunity for investment, a business opportunity, and there is work going on. Then in the social spaces also there are social bonds likewise.

So, the CDM is an opportunity as there are many Carbon development exchanges, for many years. they have diversified in other aspects also, for social investment. Many processes are being adopted, then strategies are being formed to address the issue of climate change.

Which areas do you think are the most critical when it comes to environmental protection?

As a steel industry, we are polluters of carbon-di-oxide emissions. So, reducing our emission levels to near zero, and we are making much investment towards this goal. It needs to be addressed collectively now. We may be doing things independently or individually, and to give an example, our place in Jajpur, Orissa, is not a very big space, but it is very close to the source of raw material. So, there is an opportunity for large corporations and small companies to set up there and come closer to where your raw material is. In Kalinga Nagar in the Jajpur district, there are 13 corporates, large and small, all to do with power, steel, and chrome. So, in that small place, there is a tremendous amount of pollution. Unless we address this issue now, it's going to have a long-term impact. We need water and transportation for plants, and everyone is dependent on whatever natural resources and facilities are available over there. The water from the Brahmani river is the only water source. It's a huge river, but 13 corporations, draw water. That's the biggest challenge. How do we reduce our carbon-di-oxide footprint through our process engineering? How can we create that kind of ambiance, where water that is used 10 times over is used at a minimum level? We can reduce the water required for the furnaces if we have the latest technology. If you have Carbon capture and sequestration, which is not easily available either. It is used by the next-gen corporations of the USA and is very expensive. Other production technologies available in the Scandinavian countries and Europe for example, should be made available to the developing countries at a cost that is feasible and affordable. This way, we can address this issue of mitigating CO2 emissions from the plant location.

The second part is vehicle pollution. So, whether it is the e-vehicles, or solar-powered vehicles that are coming in a bog way, alternative sources of energy, all that is linking up to the emission reduction processes. Most important are what are your water strategies? How are you addressing the water issues? The next war will be fought over water. How are you going to protect your resources? How will you make sure that with your processes you use a minimum amount of water? Reinvest and reuse your waste resources and see how you can challenge the protection of each corporate player, ensuring that the processes are such where we can reduce our carbon footprint. That's the challenge.

What type of organizations do you partner with for CSR actions?

As SDG 17 relates to Partnerships. Unless you have partners, you cannot do everything yourself, along with the indicators listed along with each SDG.

In our case, it's no different. We have partnered at the UN level, with UNSCCC for clean energy and waste energy reuse in Orissa. We are also members of the Assessing Low-Carbon Transition or ACT, created by the United Nations, based out of France, and we are one of the few members from India to be working with them. We are part of the technical working group, which is working towards assessing low carbon technologies. We are partners with the CDP (Carbon Disclosure Project). At the global level, we have partnered with these organizations. Besides that, we partner on Human Rights regarding water, women empowerment, climate. There is an organization known as the Global Business Initiative on Human rights. We are members of that. It's a global body, having about 25 companies across the world. We meet once a year, in different parts of the world, to discuss problems relating to business and human rights. This also accelerates the carbon-di-oxide reduction strategies.

At the local levels, we also have talked about how we are trying to do the climate-resilient plantation and agricultural practices. In an environment where farmers are very clear that what we have been taught for 100 years about this particular practice is to be adopted for farming. We have got to have only this crop during the Kharif season, and this crop during the Rabi season, and in between, we have got this cropping pattern. But do you see climate change? There is a change in the rainfall, and the requirement for water to be preserved. So, we do conservation of water through the various technologies which are available for growing some of these crops. We have interacted with the farmers, changed their mindset, and ensured a backend linkage of the crops. If in one geography everyone is growing a particular crop there is a glut in the market. But if the demand and supply match and farmers have digital transformation or means to make a digital transfer of money, almost on the same day when the buyer has invested, then the Mandi system, has to be addressed. The APMCs have to be addressed. Nothing to do with steel, but it's related to doubling the farmers' income.

Also, reducing the input cost, whether it has to do with water intake or money they invest for procurement of seeds, by making it available to them at the location. So, they don't have to do to a particular location and buy it at a commercial price, as when you buy in mass, you get it cheaper. Or it can be about the quality of crops, which can be bought by high-end players, and not only by the mandi, which pays a certain amount. If the price for a particular day, which is available on the mobile, which the APMC has decided that the X amount will be given, although the Government has fixed an MSP on it, they may reduce it many times lower. They tell the farmers that if they don't want to sell at that price, they can take it back. But who can take it back? So, we have developed partnerships with the local bodies and these issues are being addressed by us.

Some of the agricultural good-practices, such as reducing the use of water and electricity, have helped the farmers. That is also contributing to the environment because if they are working by using methane gas, 70% of all pollution is coming from the agricultural space. We have to address the issue related to agriculture. We have a partner named GRAM UNNATI FOUNDATION that is doing a project for us across states, essentially in Orissa and Haryana. We have also gone to Madhya Pradesh, UP, Uttarakhand. The Niti Aayog has adopted this particular pattern for 17 aspirational districts, where they want to replicate our model and scale up. Through the GRAM UNNATI FOUNDATION model, we can demonstrate what we are talking about. Before we start, there is a baseline survey, an accord is there, and development alternatives are given in some formats. Prabhaav foundation has been a strong partner for the development of sustainable parks. So, sustainable spaces, green and a happy environment are a part of meeting the goals of poverty alleviation, sustainable cities, and working towards the partnership for SDG 17. EP

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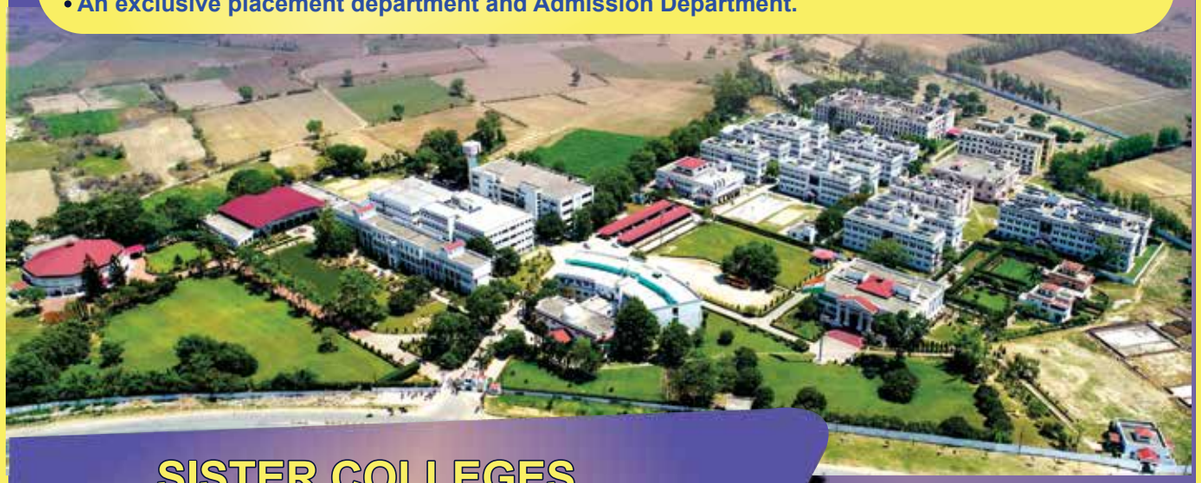

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Nixon Joseph

Bringing **Behavioural Change** amongst people in communities takes time

Nixon Joseph
CEO, CLT India, and Ex-President &
Chief Operating Officer at SBI Foundation,
Fit India Ambassador

Nixon Joseph, CEO, CLT India, and Ex-President & Chief Operating Officer at SBI Foundation, Fit India Ambassador, joined SBI in 1985 as Probation Officer and was posted in Eastern India for many years. He lived in Assam, Tripura, Meghalaya, Mizoram, etc. After this, he was posted in SBI Bahrain for few years, and then mostly worked in the Corporate Credit Department. He also worked in the SBI HQ in Mumbai and handled the drafting of green banking, carbon credit policies of SBI. He headed the SBI Tokyo branch for four years. During his stay in Japan, he got involved with the Toastmasters and initiated the Tokyo debating society there. After coming back to India, he was again posted in the northeast. He was in charge of over 40 branches of SBI in the North-East zone and managed a team of over 400 people.

Finally, he was back in Mumbai and started working with the SBI Foundation, the wing that is responsible for CSR, where he worked for over a decade. At the age of 45, he started running marathons. He realized that a change of lifestyle was needed from a sedentary banker to an active differentiator and created a circle of influence. He is the only official of SBI to take up running and is known as Marathon Legend of SBI, having completed 51 full marathons.

He is also a mentor and speaker and has participated in over 200 webinars. In May 2021, he retired from the SBI foundation and continued in the developmental sector by joining CLT India, an organization working in the education sector. Let us see what keeps him going strong.

The SBI Youth for India fellowship is aimed at bringing rural development and empowering the youth. Through this initiative, we are empowering women and villagers, making a lot of changes. All the 17 goals are touched in one way or the other. This SBI Fellowship is attracting more than 15000 applications every year, from all over the world, from youth who have studied in Harvard and Columbia University, Stanford, London School of economics, IIMs, etc.

Banker, toastmaster, marathon runner, CSR professional- How do you handle all these roles together?

As a banker, I used to work from 9 am to 9 pm. But it's a question of time management. I feel if certain things are our passion or priority, we will find time for it. We do our job as a priority, and if we look at any activity like running or public speaking as our priority, we will find time for ourselves. That is how I have been able to manage time for work and marathons and toastmasters.

Though these activities may seem very different from banking and CSR, they complement our life and work. If your job is monotonous, having a passion like this helps to do your work with excitement. When I come to the office after taking part in a marathon, I feel energized and more productive in my work. All these activities help you feel that whatever be the challenge, you can overcome it. You carry the same feeling at the workplace that whatever problems will come, I will address them. So, one must find time for any such activity that adds life to your days.

By doing these activities, you are stretching yourself, and unless you stretch beyond your comfort zone, you won't know your potential. So, being engaged in any such activity outside the periphery of work will benefit the profession and personal life.

How has your journey been with the SBI? Please share your memorable experiences.

SBI is the largest bank in India, and it was a great pride to be associated with it for so long. Joining SBI wasn't my first choice, as I wanted to join civil services. So, when I got the in SBI, I took it up and decided to like it. I felt that though I did not enjoy the job if I stay unsatisfied, how long can I be unhappy? Hardly 1% of the people in the world get the job that they like. So, I decided that I will enjoy this job.

Because of SBI, I got to see so much of India and the world. I was posted in North East India and lived in Assam, Arunachal, Tripura, Meghalaya, Mizoram, etc. It gave me a different perspective. I was very fortunate that I could see the rich culture of those states and made some great friends. I can speak the Mizo language, and I understand Assamese, Bengali, and Japanese. So, all these were blessings that I got by being with SBI.

Apart from that, as SBI is the largest bank, you get exposure to various areas of banking. I also got exposure to the treasury, investment banking, corporate credit, and retail banking. Also, I got two foreign postings in Bahrain and Japan. Being able to live and work in Japan is a great blessing. I learned a lot after observing the culture of Japan, and the Japanese way of work has greatly influenced me.

Then, I was responsible for preparing the Green Banking policy of SBI. We were the first public sector bank to develop green banking policies on financing carbon credits and the bank's approach to carbon credits. I had a great experience developing these policies.

Having been in SBI Foundation, I could see how we touched the lives of millions of people to change their lives. Also, when I was in Garo hills, in Meghalaya, two of my colleagues were kidnapped. For 80 days, they were in the custody of the kidnappers. I had to take leadership and the initiative to negotiate with the kidnappers and ensure a safe and secure release. These are all experiences that you can't forget all your life. I gained a lot and learned a lot. I saw India and the world and met people from whom I learned.

Tell us about the actions taken by the SBI Foundation for CSR. How are they aligned with the global standards, like the Sustainable Development Goals by the UN?

SBI Foundation is the CSR arm of the SBI bank and its sister concerns like the SBI mutual funds, SBI credit, and SBI Life, etc. SBI foundation was created with a vision to bring a change in the life of the marginalized, especially with a focus on rural development. All programs that we design and implement align with the SDGs. The SBI Youth for India Fellowship

Challenges are a part of life. Nowadays, people get easily de-motivated if they have some setback in personal relations, professional life, or things don't go the way they plan. Life is all about facing challenges and overcoming them. Only in fairy tale stories there are 'happily ever after' but in real life there is no such stage which has a 'happy ever after' ending. As an entrepreneur, you cannot be relaxed after you have set up the enterprise. It is full of challenges. Even if you join a dream job, there will be challenges in your way. So, success is about facing, understanding and overcoming these challenges.

During the pandemic, people were not supposed to go out and I was also advised to stop running. During a crisis, first you accept the situation and then respond positively. How I found a solution was to start jogging within my apartment. So, my policy is that if there is the will, there is an inspiring way to achieve it. If you want to achieve something passionately you can find ways to do it, only you have to come out of your comfort zone. Also, as nothing in life is permanent, so challenges will also pass.

aims at bringing rural development and empowering youths. Through this initiative, we are empowering women and villagers, making a lot of changes. This SBI Fellowship is attracting more than 15000 applications every year, from across the world, from people who have studied at Harvard and Columbia University, Stanford, London School of Economics, IIMs, etc. People with lucrative careers in companies like Google, PWC, Infosys, Bank of America, etc., are also coming here, leaving their job and joining the rural fellowship to bring change in villages. So, all those people are coming with a passion for being changemakers.

This program is bringing about real impact, and I'm very proud to tell you that 70% of the fellows we select are girls. We believe that empowering women means empowering society. It's heartening to see that the young women, whose average age is 24, are willing to go to the remote parts of India to bring change. I asked them during the selection interview if they thought it was right to go for a rural fellowship with COVID at its peak. They answered that for bringing change in society, there is no specific time. So, we have such inspiring youths, and every year we select 100 people for this fellowship program. I have been lucky to have got a chance to mentor them. Each person addresses one issue in the villages, finds solutions, resolves the issue, and comes out of the fellowship. That means, every year, the fellows solve 100 issues in the villages. Some of them even start social enterprises, which give livelihood opportunities to many others. One such example is of a boy who worked for Bank of America, Singapore. He left his job, went to the Kalahandi district of Orissa, and mobilized young women from the poor sections of society. Many of these women then started self-help groups to help others in their villages. So that's the kind of change this program is bringing.

Another program that we are having is SBI Gram Seva, where holistic development of villages is taking place, and it is also touching most of the 17 SDGs. Then there is the SBI Centre of Excellence for persons with disabilities. There we are trying to remove the barriers to employment and employability of these persons with disabilities.

Tell us about your current role as the CEO of CLT India. What are the vision and missions of the organization?

After leaving SBI, I took over as the CEO of CLT India, an NGO in the education space, which started in 1997. The founder, Bhagya Rangachar, had a strong career in the USA, which she left for this work. During one of her visits to Bangalore, she saw a group of children playing with clay and sand and thought about the dreams that they might be having. From there, she started CLT India, and under her leadership, the organization has grown. It provides STEM education to students in over 4000 government schools in regional language, without any internet facility. So, it's a high-quality STEM education solution on digital medium. I'm proud to be part of this initiative.

The E-Pathshala is a low-cost solution, the content quality is excellent, and it is available in Kannada, English, and Hindi. We are ready to bring it in other regional languages if the state governments require it. The impact of providing such education to marginalized children will be huge. Teaching science, maths, English to government school students can change their future in a big way. It provides content for grades 5 to 10th currently. It costs a lot to prepare the in-house content with excellent quality of resources. So, philanthropists, CSR organizations are ready to fund it. Delivering in all regional languages will be a game-changer in terms of the results of the students.

Many have bright ideas to set up start-ups, but only the idea is not enough for a start-up to succeed. We should have other entrepreneurial qualities also. So, focus on developing those qualities along with the passion of implementing the idea.

Any plans to partner with any non-government organization or research center?

See, SDG 17 is about partnership. I believe that partnering and collaboration are the keys to bringing more effective and upscaling all activities. So, in developing or marketing our digital content provided through e-Pathshala, involving various organizations and government schools for research and delivery, we look at partnerships and collaboration with all those who are willing to support this noble initiative.

As a mentor, what are the areas of concern for which you guide youngsters?

I have been interacting with youths over the last few years, as even after the fellowship programs are over, most of the participants stay in touch with me. I have observed that our youth want to bring change as they are passionate about the climate, environment, etc. But then they also want the change to come fast. I always advise and tell them that change does not come so fast. You have to be determined and patient because

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bringing behavioral change amongst people in communities takes time. You cannot expect it to change within a month or even a year. Also, many have bright ideas for start-ups, but I tell them that only an idea is not enough for a start-up to succeed. You need other entrepreneurial qualities also. So, focus on developing those qualities along with the passion of implementing the idea. Pitching, marketing, and soft skills are also very important. So, if you are good at communication, add people who are good in finance, planning, marketing, and the rest, so that the start-up can be successful.

They should understand that challenges are a part of life. Nowadays, people get easily demotivated if they have some setback. Life is all about facing challenges and overcoming them. There is no such stage in real life that has a happy ever after ending. As an entrepreneur, you cannot relax after you have set up the enterprise. It is full of challenges. Even if you join a dream job, there will be challenges in your way. So, success is about facing, understanding, and overcoming these challenges.

For instance, during the pandemic, people were not supposed to go out. During a crisis, first, you accept the situation and then respond positively. I found a solution by starting jogging within my apartment. So, my policy is that if there is the will, there is an inspiring way to achieve it. If you want to achieve something passionately you can find ways to do it, but you have to come out of your comfort zone. Also, as nothing in life is permanent, so challenges will also pass.

Deadlines are a part of every job. I used to close my office at 6 pm because I take care of my health. I tell everyone that if you give importance to your health, you will work diligently. There is no need to run marathons; do any activity which will give movement to your body. Earlier, we were talking about providing only literacy. Now what we have to do is bring efforts to improve physical literacy. I changed myself at the age of 45 years, so why can't young people do it. EP

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Inbarajan Palanisamy

TECHNOLOGY HAS TAKEN CENTRE STAGE

It is not just driving consumer growth, but also moving enterprise digital transformation.

Inbarajan Palanisamy
Business Head - VerSe Innovation

You have been a business builder and have created assets from scratch. What are your guiding principles and work ethics?

I focus on intelligence and integrity. Beyond being a good human being, passionate, process-minded, growth hacker, an enabler for people, and walking the talk, the qualities of intelligence and integrity are hygiene factors now. These are the things that have kept me going. Earlier, these might have been assets, but now these are essentials.

To draw a comparison for India in the global context, the global SaaS market in itself will be a 500 billion revenue opportunity by 2025, as the growth percentage could go up to 18%-20% globally. But if we have to evaluate the Indian SaaS opportunity, maybe we are anywhere between 2.5 to 3 billion revenue opportunity right now. We have at least 10 companies that have gone in the unicorn club. A company in the API space has raised some capital and they are valued at 5.6 billion dollars, and it's an Indian company.

And while intelligence is something that you define based on the role and may differ from one organization to the other, integrity is inherent in the person; they bring it to the table. When you possess both of them together, then there comes innovation, the responsibility of delivering what is expected from you, enabling people, working with your team, ensuring that their success is your success, and these things go hand in hand. Once you explore yourself and build these qualities, they have a ripple effect across the organization.

Having exposure in multiple domains like banking, real estate, print media, and now apps, what learning did you get from each phase?

Being versatile and having this multi-domain experience is an added advantage. It feels great to have attained expertise in varied sectors like real-estate, banking, print medium, consumer tech space, etc. It is supercritical to know how deep can one dive to improve the domain expertise and knowledge, and hence, create value. My learning has been immense, very enriching.

There are the top two things that I would state as my learnings, cutting across the domains. First, there is no replacement for hard work. Secondly, in each of the domains where I worked, I remembered that the customer is the king. Be it the banking domain, real-estate, print media, or consumer tech space, the customer is going to be the kingin the past, present or future. What problem are we solving for the end customers is the key. So, knowing how deeper can we go in terms of understanding the domain, how we create value for the function and the organization, that is supercritical. At the same time, we need to know how we create value for the co-workers and the team, and for the customers, and in this process, create value for yourself. These have been my key learning.

What's the future of the SaaS business, as well as tech product-based businesses in India?

I was reading a report which claimed that India's SaaS companies will be a trillion-dollar opportunity, creating at least 5 lakh jobs by 2030. So that is the kind of opportunity that will get unfolded, at least in terms of SaaS sub-space. Now, because of the pandemic, the SaaS companies in India have been beneficiaries. As more enterprises embrace digital transformation, this change will drive massive growth in the Indian context.

Now, to draw a comparison for India in the global context, the global SaaS market in itself will be a 500 billion revenue opportunity by 2025, as the growth percentage could go up to 18% to 20% globally. But if we have to evaluate the Indian SaaS opportunity, maybe we are anywhere between 2.5 to 3 billion revenue opportunity right now. We have at least ten companies that have gone into the unicorn club. An Indian company in the API space has raised some capital and is valued at 5.6 billion dollars. Overall, there must be over 1000 companies in the SaaS space in India. The companies are getting well-funded, as technology has taken centre stage. When I say SaaS space, it does not stay limited to one domain. It cuts across core tech space, fintech, EdTech, and multiple entities that have come in. So that is the kind of opportunity that the pandemic has triggered.

We have seen a paradigm shift in the teaching-learning processes. How will the 'new normal' further impact education?

If you look at the education ecosystem, there are multiple verticals within this space. Now, if we break them into five large verticals, we will be having the K-12 first. Then post K-12, the test-prep segment is there for the competitive exams. The third predominant section would be the higher education, graduation, and post-graduation vertical. The fourth-largest is the vertical for government jobs preparation, including the IAS, IPS, for both the centre and the state level. Then you have the upskilling space, which is maybe just scratching the surface as far as reach is concerned. So, all of these five verticals in the education system have been impacted because of the pandemic.

Barring the upskilling space, the rest of the verticals have predominantly believed in the physical learning system, be it the college or the school. There's a teacher in person and activities that are done in the physical, offline format. This concept has been considerably disrupted by the pandemic. I think a blended model, where the students will be accessing educational content online and exercising them physically will result in holistic learning. Online has enabled continuous learning, without disrupting the learning process. Now, a "phygital" model is needed, where learning is online, plus has some physical interaction. It can help people socialize as well, and this will help in holistic growth.

I think there's another challenge as well, as far as delivering educational content to recipients across Indian geography is concerned.

There is now a plethora of tools available for e-education. What's the prospect of this vertical and what will drive its growth?

The options are aplenty now. But as I mentioned, it is an opportunity statement or a challenge statement depending on how you perceive it. Solving the digital divide is going to be a huge task. While someone in a tier 1 city can access Edu-content with better technology, the question is that how do we enable students in rural India, across all tier 2,3,4 cities. They need better connectivity and a level playing field, at least in the education space.

If we can solve the challenges in enabling quality education for everyone, by not just letting it be limited to the tier one population, and if it is possible to provide

that content in their preferred vernacular language, the growth would be humungous in this vertical.

It's true that there is a plethora of tools, from quizzes to assessments, or from core learning to co-curricular activities, that are being done online. While we have so many choices, the issue is that how do we bridge this digital divide? How do we ensure that there is a level playing field, across the geography? We have to enable the markets in smaller cities, by providing them content in their language.

The engineering courses in India are already evaluating delivering courses in regional language. Can this happen across course offerings? Can it be done in medical or other fields? If it's possible, then it is going to empower people, as they are going to access content digitally in their language, and it can bring a lot of talent to the mainstream. So, can EdTech companies think of it from the end user's standpoint? What problem are they solving by their enabling content, delivering content virtually to all? There is this SaaS product that is taking this content to multiple places across the country. But can they enable it for everyone in vernacular language, that's the point.

As a mentor, share your suggestions with students regarding the domains that they must choose to specialize in, looking at the future in the digital business domain.

I had the benefit of mentoring a lot of B-school students across the country every year. I believe that everyone brings something unique to the table. Every resource is valuable. As mentors, our responsibility is to enable the future leaders of India to bring out their uniqueness to the table, and help them to be successful. That should be the focus area as far as mentoring is concerned.

Technology has taken center stage; it is not just driving consumer growth, but also moving enterprise digital transformation. This sector is witnessing massive growth due to this pandemic. So, my suggestion will be that one should look inside, to know what is a unique ability, what is my passion, how do I select the relevant function, course, college, and so on.

The current school-going kids will get into a job opportunity that is not existing right now. What is trending currently, is digital, data, personalization, voice, video, vernacular, customer success, product innovation, etc., from the skills point of view.

Coming from the consumer tech space, what are we solving for the end customer in the Agri-tech, fintech, EdTech, etc. Today in fintech, we are talking about blockchain technology, cryptocurrency in India, though the policy regulations are at a very nascent stage. Also, see what has health tech done to the end consumers. It has brought the consultation at the click of a button, through the mobile phone. In the EdTech space, whether it is K-12 content, college content, or upskilling content, everything is available online. So, these are the things that are enabling people.

The current generation should focus on the problem they are solving for the consumers, and then get into those domains. But the first thing they will have to evaluate is who they are, what is their ability, what they are known for, and the passion that drives them. Then they should evaluate the options in front of them.

Earlier, medical and engineering were the only viable options for career choices. But now, even in a tier 2 market, you can be a unique content creator, creating content in the entertainment or music space. That is also an avenue for earning revenue. So, people have to check as to what is their strength. It should not just be thrust upon them. There are now several options for a career.

They have to see what additional tech skills they can add to their knowledge. Earlier knowing basic computer skills was considered beneficial. Now, students can add that they know about digital marketing, data science, or personalized content. These will become hygiene factors, beyond the basic studies. EP

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1	Birla Institute Of Technology and Science (BITS Pilani)	Pilani	Rajasthan	1
2	Birla Institute of Technology	Mesra	Jharkhand	1
3	Vellore Institute of Technology	Vellore	Tamil Nadu	1
4	Thapar University (Thapar Institute of Engineering & Technology)	Patiala	Panjab	1
5	Amrita Vishwa Vidyapeetham University	Coimbatore	Tamil Nadu	2
6	Manipal Institute of Technology (Manipal Academy of Higher Education)	Manipal	Karnataka	1
7	Faculty of Engineering, Bharath Institute of Higher Education and Research (BIHER)	Chennai	Tamil Nadu	3
8	SRM Institute Of Science & Technology	Chennai	Tamil Nadu	4
9	PEC University of Technology	Chandigarh	Panjab	2
10	IFHE Hyderabad	Hyderabad	Telangana	1
11	Kalinga Institute of Industrial Technology (KIIT)	Bhubaneswar	Odisha	1
12	PSG College of Technology	Coimbatore	Tamil Nadu	5
13	RV College of Engineering	Bangalore	Karnataka	2
14	BMS College Of Engineering	Bangalore	Karnataka	3
15	Coimbatore Institute of Technology	Coimbatore	Tamil Nadu	6
16	Bharatiya Vidya Bhawan's Sardar Patel Institute of Technology	Mumbai	Maharashtra	1

* Page 6

IIRF-2021 | BEST ENGINEERING COLLEGES (PVT.)

ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
17	Sathyabama Institute of Science and Technology	Chennai	Tamil Nadu	7
18	Shiv Nadar University (SNU)	Dadri	Uttar Pradesh	1
19	Meenakshi College of Engineering (MCE)	Chennai	Tamil Nadu	8
20	Periyar Maniammai Institute of Science & Technology	Thanjavur	Tamil Nadu	9
20	Sri Muthukumaran Institute of Technology (SMIT)	Chennai	Tamil Nadu	9
21	Thiagarajar College of Engineering	Madurai	Tamil Nadu	10
22	Dhirubhai Ambani Institute of Information and Communication Technology	Gandhinagar	Gujarat	1
23	Birsa Institute of Technology	Sindri	Jharkhand	2
24	SDM College Of Engineering and Technology	Dharwad	Karnataka	4
25	MS Ramaiah Institute Of Technology	Bangalore	Karnataka	5
26	REVA University (Faculty of Engineering and Technology)	Bangalore	Karnataka	6
27	BITS Pilani (Hyderabad Campus)	Hyderabad	Telangana	2
28	BP Poddar Institute Of Management and Technology	Kolkata	West Bengal	1
29	Koneru Lakshmaiah Education Foundation University (K L College of Engineering)	Vaddeswaram	Andhra Pradesh	1
30	CV Raman College Of Engineering	Bhubaneswar	Odisha	2

* Page 6

ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
31	PES Instituite of Technology, Bangalore South Campus (Formerly PES Scool of Engineering)	Bangalore	Karnataka	7
32	Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Technology	Chennai	Tamil Nadu	11
33	NMIMS University (Mukesh Patel School of Technology Management and Engineering)	Mumbai	Maharashtra	2
34	Amity University	Noida	Uttar Pradesh	2
35	Dayanand Sagar College of Engineering	Bangalore	Karnataka	8
36	Bharti Vidhyapeeth College of Engineering	Delhi	Delhi	1
37	St. Joseph College Of Engineering	Chennai	Tamil Nadu	12
38	PE Society's Modern College of Engineering	Pune	Maharashtra	3
39	Shiksha 'O' Anusandhan (Institute of Technical Educa- tion and Research)	Bhubaneswar	Odisha	3
39	Faculty of Engineering and Technology (Dr. M G R Educational and Research Institute)	Chennai	Tamil Nadu	13
40	Nirma University (Institute of Technology)	Ahmedabad	Gujarat	2
41	Chandigarh University (University Institute of Engineering)	Mohali	Panjab	3
42	Dharmsinh Desai University - Faculty of Technology	Nadiad	Gujarat	3
43	Shanmugha Arts Science Technology & Research Academy	Thanjavur	Tamil Nadu	14

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ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
44	Kumarguru College of Technology	Coimbatore	Tamil Nadu	15
45	Sri Sivasubramaniya Nadar College of Engineering	Kancheepuram	Tamil Nadu	16
46	BK Birla Institute Of Engineering and Technology	Pilani	Rajasthan	2
47	ICFAI University	Dehradun	Uttarakhand	1
48	Anil Neerukonda Institute of Technology and Science	Vishakhapatnam	Andhra Pradesh	2
49	NIIT University	Neemrana	Rajasthan	3
50	Siddaganga Institute of Technology	Tumkur	Karnataka	9
51	Presidency University (School of Engineering)	Bangalore	Karnataka	10
52	B.N.M Institute of Technology	Bengaluru	Karnataka	11
52	CVR College of Engineering	Hyderabad	Telangana	3
53	Christ University	Bangalore	Karnataka	12
54	JSS Science and Technology	Mysuru	Karnataka	13
55	Symbiosis International University	Pune	Maharashtra	4
56	Bharati Vidyapeeth Deemed University College of Engineering	Pune	Maharashtra	5
57	Bapuji Institute of Engineering and Technology	Davangere	Karnataka	14
58	BMS Institute of Technology	Bangalore	Karnataka	15
59	Kongu Engineering College	Perundurai	Tamil Nadu	17

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ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
60	Bharati Vidyapeeth College Of Engineering	Navi Mumbai	Maharashtra	6
61	MODY University of Science and Technology (SET)	Lakshmangarh	Rajasthan	4
62	Sardar Patel College Of Engineering	Mumbai	Maharashtra	7
63	Jaipur Engineering College and Research Center (JECRC)	Jaipur	Rajasthan	5
64	Lovely Professional University	Jalandhar	Panjab	4
65	Bannari Amman Institute of Technology	Sathyamangalam	Tamil Nadu	18
66	Chaitanya Bharathi Institute of Technology	Hyderabad	Telangana	4
67	College Of Engineering	Roorkee	Uttarakhand	2
67	University Of Petroleum and Energy Studies (UPES)	Dehradun	Uttarakhand	2
68	MES College of Engineering	Kuttipuram	Kerala	1
69	Acharya Institute Of Technology	Bangalore	Karnataka	16
70	School of Engineering and Technology, ADAMAS University	Kolkata	West Bengal	2
71	ICFAI University	Jaipur	Rajasthan	6
71	Sri Krishna college of Engineering and Technology	Coimbatore	Tamil Nadu	19
72	Mahakal Group of Institutes	Ujjain	Madhya Pradesh	1
73	Mepco Schlenk Engineering College	Sivakasi	Tamil Nadu	20
74	Birla Institute of Technology	Patna	Bihar	1

* Page 6

ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
75	Bhilai Institute of Technology	Durg	Chhattisgarh	1
76	Maturi Venkata Subba Rao Engineering College	Hyderabad	Telangana	5
77	Atharva College Of Engineering	Malad	Maharashtra	8
78	Alliance University	Bangalore	Karnataka	17
79	Hindustan Institute of Technology and Science	Chennai	Tamil Nadu	21
80	Graphic Era University	Dehradun	Uttarakhand	3
81	Sri Venkateswara College Of Engineering	Kancheepuram	Tamil Nadu	22
82	LNM Institute of Information Technology	Jaipur	Rajasthan	7
83	G.H. Raisoni College Of Engineering	Nagpur	Maharashtra	9
84	Vignan's Foundation For Science Technology and Research	Guntur	Andhra Pradesh	3
85	Bipin Tripathi Kumaon Institute of Technology (Formerly Kumaon Engineering College)	Dwarahat	Uttarakhand	4
86	Vidyavardhaka College of Engineering	Mysuru	Karnataka	18
87	IMS Engineering College	Ghaziabad	Uttar Pradesh	3
87	Federal Institute Of Science and Technology	Ernakulam	Kerala	2
88	KJ Somaiya College Of Engineering	Mumbai	Maharashtra	10
89	M Kumarasamy College of Engineering	Karur	Tamil Nadu	23

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ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
90	TKM College of Engineering	Kollam	Kerala	3
91	Amity University	Jaipur	Rajasthan	8
92	Krishna Institute of Engineering and Technology (KIET)	Ghaziabad	Uttar Pradesh	4
93	Bhagwant University	Ajmer	Rajasthan	9
94	Chandigarh College of Engineering and Technology	Chandigarh	Punjab	5
95	Francis Xavier Engineering College	Tirunelveli	Tamil Nadu	24
96	Heritage Institute Of Technology	KolKata	West Bengal	3
97	Guru Nanak Institute Of Technology	Secunderabad	Telangana	6
98	Rajalakshmi Engineering College	Chennai	Tamil Nadu	25
99	Jain University	Bangalore	Karnataka	19
100	Karunya Institute of Technology and Sciences	Coimbatore	Tamil Nadu	26
101	Maharishi Markandeshwar University	Mullana	Haryana	1
102	G L Bajaj Institute of Technology and Management	Greater Noida	Uttar Pradesh	5
103	Rizvi College Of Engineering	Bandra	Maharashtra	11
104	Sri Sairam Engineering College	Kancheepuram	Tamil Nadu	27
105	Ballari Institute Of Technology and Management	Bellary	Karnataka	20
106	Swami Keshvanand Institute Of Technology, Management and Gramothan	Jaipur	Rajasthan	10

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ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
107	Dr. Mahalingam College Of Engineering & Technology	Pollachi	Tamil Nadu	28
108	Yeshwantrao Chavan College of Engineering	Nagpur	Maharashtra	12
109	CGC College Of Engineering, Landran Campus	Mohali	Maharashtra	13
110	Birla Vishvakarma Mahavidyalaya	Anand	Gujarat	4
111	Dr. DY Patil Institute Of Engineering and Technology	Pune	Maharashtra	14
112	DY Patil College Of Engineering, Akurdi	Pune	Maharashtra	15
113	G Narayanamma Institute Of Technology and Science (For Women)	Hyderabad	Telangana	7
114	Dr. Ambedkar Institute Of Technology	Bangalore	Karnataka	21
115	Dr. Ambedkar Institute Of Technology For Handicapped	Kanpur	Uttar Pradesh	6
116	Gandhi Institute Of Technology and Management (GITAM)	Vishakhapatnam	Andhra Pradesh	4
117	Noida Institute of Engineering and Technology (NIET)	Greater Noida	Uttar Pradesh	7
118	G Pullaiah College Of Engineering and Technology	Kurnool	Andhra Pradesh	5
119	Jaypee Institute Of Information Technology (Main Campus)	Noida	Uttar Pradesh	8
120	Jain College Of Engineering	Belagaum	Karnataka	22
121	KJ Somaiya Institute Of Engineering and Information Technology	Mumbai	Maharashtra	16

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ALL INDIA RANK*	NAME OF INSTITUTES	CITY	STATE	STATE RANK*
122	NITTE Meenakshi Institute Of Technology	Bangalore	Karnataka	23
123	NMAM Institute Of Technology, NITTE	Karkala	Karnataka	24
124	Gayatri Vidya Parishad College Of Engineering	Vishakhapatnam	Andhra Pradesh	6
125	BVRIT	Hyderabad	Telangana	8
126	ITM University	Gwalior	Madhya Pradesh	2
127	Sri Krishna College of Technology	Coimbatore	Tamil Nadu	29
128	Institute Of Information and Communication Technology	Ahemdabad	Gujarat	5
129	Vardhaman College of Engineering	Rangareddy	Telangana	9
130	Kalasalingam University	Virudhnagar	Tamil Nadu	30
131	Karnatak Law Society's Gogte Institute Of Technology	Belgaum	Karnataka	25
132	KL University (Koneru Lakshmaiah Education Foundation)	Vijaywada	Andhra Pradesh	7
133	KU College Of Engineering and Technology	Warangal	Telangana	10
134	KLS Gogte Institute Of technology	Belagaum	Karnataka	26
135	Ajay Kumar Garg Engineering College	Ghaziabad	Uttar Pradesh	9

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Indian Institute of Technology	Government	Delhi	1
Indian Institute of Technology	Government	Chennai	2
Indian Institute of Technology	Government	Bombay	3
Indian Institute of Technology	Government	Kharagpur	4
Indian Institute of Technology	Government	Guwahati	5
Indian Institute of Technology	Government	Kanpur	6
Indian Institute of Technology (BHU)	Government	Varanasi	7
Indian Institute of Technology	Government	Roorkee	8
Institute of Chemical Technology	Government	Mumbai	9
Delhi Technological University	Government	Delhi	10
Indian Institute Of Space Science and Technology (IISST)	Government	Thiruvananthapuram	11
Netaji Subhas Institute of Technology	Government	New Delhi	12
Anna University	Government	Chennai	13
Harcourt Butler Technological Institute	Government	Kanpur	14
Indian Institute of Technology	Government	Gandhinagar	14
Indian Institute of Technology	Government	Indore	15
Indian Institute of Information Technology	Government	Allahabad	15

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
ABV Indian Institute of Information Technology & Management	Government	Gwalior	16
Indian Institute of Technology	Government	Ropar	17
Indian Institute of Technology (ISM)	Government	Dhanbad	18
Motilal Nehru National Institute of Technology	Government	Allahabad	19
Indian Institute of Technology	Government	Hyderabad	20
Indian Institute of Technology	Government	Mandi	21
National Institute of Food Technology Enterpreneurship and Management (NIFTEM)	Government	Sonipat	22
National Institute of Technology	Government	Tiruchirappalli	23
National Power Training Institute-Northern Region	Government	Delhi	24
G. B. Pant University of Agriculture and Technology (College of Technology)	Government	Pantnagar	25
National Institute of Technology	Government	Rourkela	26
Indian Institute of Technology	Government	Bhubaneswar	27
Indian Institute of Technology	Government	Jodhpur	28
National Institute of Technology	Government	Delhi	29
National Institute of Industrial Engineering	Government	Mumbai	30
National Institute of Technology	Government	Warangal	31

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
National Institute of Technology	Government	Durgapur	32
G. B. Pant Engineering College	Government	Pauri	33
Indian Institute of Technology	Government	Patna	34
Aligarh Muslim University (AMU)	Government	Aligarh	35
Indian Institute of Information Technology Design & Manufacturing	Government	Kancheepuram	36
College of Engineering	Government	Pune	37
College of Engineering	Government	Trivendrum	38
National Institute of Technology	Government	Raipur	39
National Institute of Foundry & Forge Technology	Government	Ranchi	40
Indian Institute Of Information Technology Design and Manufacturing	Government	Jabalpur	41
Dr. B. R. Ambedkar National Institute of Technology	Government	Jalandhar	42
Central Institute of Plastic Engineering & Technology	Government	Bhubaneswar	43
National Institute of Technology	Government	Kurukshetra	44
National Institute of Technology	Government	Uttarakhand	45
National Institute of Technology	Government	Srinagar	46
Sardar Vallabhbhai National Institute of Technology	Government	Surat	47

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
Malviya National Institute of Technology	Government	Jaipur	48
Indian Institute of Information Technology, Design and Manafacturing	Government	Chennai	48
Maulana Azad National Institute of Technology	Government	Bhopal	49
National Institute of Technology	Government	Hamirpur	50
Indraprastha Institute of Information Technology	Government	New Delhi	51
Punjab University	Government	Chandigarh	52
National Institute of Technology	Government	Arunachal Pradesh	53
National Institute of Technology	Government	Silchar	54
National Power Training Institute	Government	Durgapur	55
International Institute of Information Technology	Government	Hyderabad	56
National Institute of Science & Technology	Government	Berhampur	57
Visvesvaraya National Institute of Technology	Government	Nagpur	58
Jamia Millia Islamia	Government	New Delhi	59
National Institute of Technology	Government	Manipur	60
National Power Training Institute	Government	Nagpur	61
National Institute of Technology	Government	Meghalaya	62

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
Jorhat Engineering College	Government	Jorhat	63
National Institute of Technology	Government	Calicut	64
National Institute of Technology	Government	Jamshedpur	65
National Institute of Technology	Government	Agartala	65
National Institute of Technology	Government	Goa	66
Defence Institute of Advanced Technology	Government	Pune	67
JNTU College of Engineering	Government	Hyderabad	67
Maharaja Surajmal Institute of Technology	Government	New Delhi	68
Government College of Technology	Government	Coimbatore	69
Army Institute Of Technology	Government	Pune	70
College Of Agricultural Engineering and Technology- Punjab Agricultural University	Government	Ludhiana	71
University College of Engineering Osmania University	Government	Hyderabad	72
Jadavpur University - Faculty of Engineering and Technology	Government	KolKata	73
National Institute of Technology	Government	Nagaland	74
National Institute of Technology	Government	Sikkim	74

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
National Institute of Technology	Government	Mizoram	75
National Institute of Technology	Government	Surathkal	76
International Institute of Information Technology	Government	Bangalore	77
University School of Information & Communication Technology (GGSIPU)	Government	Delhi	78
Maharaja Agrasen Institute of Technology	Government	Delhi	79
College Of Engineering & Technology	Government	Bhubaneswar	80
Sant Longowal Institute Of Engineering and Technology	Government	Sangrur	81
National Institute of Technology	Government	Patna	82
JNTU College of Engineering	Government	Kakinada	83
Mahatma Gandhi Institute of Technology	Government	Hyderabad	84
MMM Engineering College	Government	Gorakhpur	85
University Institute Of Chemical Technology, North Maharashtra University	Government	Jalgaon	86
Rajiv Gandhi Institute of Technology	Government	Kottayam	87
University School Of Biotechnology (GGSIPU)	Government	Delhi	88
Assam University - Triguna Sen School of Technology	Government	Silchar	88

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
Bengal Engineering and Science University	Government	Shibpur	89
Pandit Dwarka Prasad Mishra Indian Institute of Information Technology, Design and Manufacturing (IIITDM) Jabalpur	Government	Jabalpur	90
Institute of Engineering & Technology	Government	Lucknow	91
Government Engineering College, Barton Hill	Government	Thiruvananthapuram	92
JIET School of Engineering and Technology for Girls	Government	Jodhpur	93
College Of Engineering (University Department, Anna University)	Government	Guindy	94
Institute of Engineering & Management	Government	Kolkata	95
Government College of Engineering	Government	Amrawati	96
Gurukul Kangri Vishwavidyalaya (Faculty of Engineering)	Government	Haridwar	97
University Department Of Chemical Technology, Amrawati University	Government	Amrawati	98
University Science Instrumentation Centre, University of Kalyani	Government	Nadia	99
University College Of Engineering, Punjab Technical University	Government	Patiala	100
University Institute Of Engineering and Technology, maharshi Dayananda University	Government	Rohtak	101

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
University Institute Of Engineering and Technology, Kurukshetra University	Government	Kurukshetra	102
University Department Of Anna University BITS Campus	Government	Tiruchirappalli	103
Indian Institute of Carpet Technology	Government	Bhadohi	104
Dr. Baba Saheb Ambedkar Technological University	Government	Raigad	105
Dr. Bhimrao Ambedkar Engineering College of Information Technology	Government	Banda	106
Indira Gandhi Institute of Technology	Government	Sarang	107
Central Food Technological Research Institute	Government	Mysuru	108
Indira Gandhi Engineering College	Government	Sagar	109
Rajasthan Technical University - University College Of Engineering	Government	Kota	110
University College Of Engineering	Government	Villupuram	111
University College Of Engineering	Government	Tindivanam	112
College of Agricultural Engineering and technology- CCS Haryana Agricultural University	Government	Hisar	113
College of Engineering	Government	Thiruvananthapuram	114
Pondicherry Engineering College	Government	Pondicherry	115
Ch. Devi Lal Memorial Government Engineering College	Government	Sirsa	116

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
University College Of Engineering	Government	Arni	117
The National Institute Of Engineering	Government	Bangalore	118
Vishwakarma Government Engineering College	Government	Chand Kheda	119
Sree Venkateswara University College Of Engineering	Government	Tirupati	120
Thanthai Periyar Government Institute Of Technology	Government	Vellore	121
Ambedkar Institute of Advance Communication Technologies and Research	Government	Delhi	122
JNTU College of Engineering	Government	Anantpur	122
Guru Gobind Singh Indraprastha University	Government	New Delhi	123
West Bengal University Of Technology	Government	KolKata	124
JNTU University College of Engineering	Government	Vizianagaram	125
JNTUA College of Engineering	Government	Cuddapah	126
JNTUH College of Engineering	Government	Karimnagar	127
Government College of Engineering	Government	Kannur	128
Government College of Engineering and Ceramic Technology	Government	Kolkata	129
Government College of Engineering and Textile Technology	Government	Berhampore	130
Maharaja Institute of Technology	Government	Thandavapura	131

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
College of Technology and Engineering, Maharana Pratap University of Agriculture and Technology	Government	Udaipur	132
Mysuru Royal Institute of Technology	Government	Mysuru	133
Pandit Deendayal Petroleum University	Government	Gandhinagar	134
Kalyani Government Engineering College	Government	Nadia	135
Kamla Nehru Institute of Technology	Government	Sultanpur	136
Jodhpur National University	Government	Jaipur	137
Deenbandhu Chhotu ram University Of Science and Technology	Government	Murthal	138
Dibrugarh University - Institute Of Engineering & Technology	Government	Dibrugarh	139
Faculty Of Technology and Engineering, The Maharaja Sayajirao University Of Baroda	Government	Vadodara	140
Mahatma Jyoti Rao Phule University	Government	Jaipur	141
Guru Nanak Dev University - Faculty Of Engineering	Government	Amritsar	142
Maharaja Sayajirao University of Baroda	Government	Vadodara	143
Government College Of Engineering Textile Technology	Government	Kolkata	144
GB Pant Government Engineering College	Government	Delhi	145
Guru Jambheshwar University Of Science and Technology - Dept of Computer Science and Engineering	Government	Hisar	146

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
Institute Of Mass Communication and Media Technology, Kurukshetra University	Government	Kurukshetra	147
Government College Of Engineering and Research	Government	Pune	148
Indira Gandhi Institute Of Technology	Government	Delhi	149
Mahatma Gandhi Mission's Jawaharlal Nehru Engineering College	Government	Aurangabad	150
Institute Of Engineering & Technology, MJP Rohilkhand University	Government	Bareilly	151
West Bengal University Of Animal and Fishery Sciences	Government	KolKata	152
Rajasthan College Of Engineering For Women	Government	Jaipur	153
Maulana Abdul Kalam Azad University of Technology	Government	Nadia	154
Orissa School Of Mining Engineering	Government	Kendujhar	155
Mahatma Gandhi Mission's College Of Engineering and Technology	Government	Navi Mumbai	156
Manyawar Kansi Ram Engineering College Of Information Technology	Government	Ambedkar Nagar	157
Don Bosco University (Don Bosco College Of Engineering and Technology)	Government	Guwahati	158
Shri Guru Govind Singhji Institute Of Engineering and Technology	Government	Vishnupuri	159
North Eastern Regional Institute of Science & Technology	Government	Itanagar	160

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
Haldia Institute of Technology	Government	Haldia	161
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University Of Science & Technology Meghalaya	Government	Ri- Bhoi	165
University School Of Chemical Technology	Government	Delhi	166
University Institute Of Technology	Government	Burdwan	167
Uttar Pradesh Textile Technology Institute	Government	Kanpur	168
University institute Of Chemical Engineering and Technology	Government	Chandigarh	169
Rajiv Gandhi University - Faculty Of Engineering and Technology	Government	Papum pare	170
Rajiv Gandhi Institute Of Petroleum Technology	Government	Raibareli	171
Dr.Ram Manohar Lohia Awadh University - Institute Of Engineering Technology	Government	Faizabad	172
University Institute Of Technology, Barkatullah University	Government	Bhopal	173
College Of Engineering	Government	Bhubaneswar	174
Institute Of Technology, Guru Ghasidas Vishwavidyalaya	Government	Bilaspur	175

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NAME OF INSTITUTES	STATUS	CITY	ALL INDIA RANK* SURVEY/ PERSPECTIVE BASED
University Institute Of Engineering & technology, Panjab University SSG Regional Center	Government	Hoshiarpur	176
University Institute Of Engineering and Technology	Government	Chandigarh	177
Feroze Gandhi Institute Of Engineering & Technology	Government	Raebareli	178
Jalpaiguri Government Engineering College	Government	Jalpaiguri	179
Mizoram University - School Of Engineering and Technology	Government	Aizawl	180
University Institute Of Technology-Rajiv Gandhi Proudyogiki Vishwavidyalaya	Government	Bhopal	181
Nagaland University - School Of Engineering and Technology and Management	Government	Lumami	182
University College Of Engineering	Government	Thodupuzha	183
Ujjain Engineering College	Government	Ujjain	184

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Dr. Roopak Vasishtha
CEO & DG, AMHSSC

WHY A CAREER IN APPAREL PATTERN MAKING?

Do you wish to be in a career that will always be in demand? Then you should consider becoming a Pattern maker, as the pattern maker plays a vital role in the fashion and Apparel manufacturing industry, and every apparel house hires several people for this job role.

In some companies, the job title for a pattern maker might be apparel pattern maker or fabric pattern maker. It is the job of the pattern maker to create a pattern either free-hand or with a computer-aided drafting software. Pattern making is the fundamental step towards designing a beautiful and perfect piece of garment.

In this article, we have elaborated about the importance of pattern making in the fashion and apparel Industry. The prerequisite skills involved in pattern making and career opportunities.

What is Pattern making?

A pattern is a template from which part of a garment is traced onto the fabric before being cut out and assembled; patterns are usually made of paper. Pattern Making is a blueprint for the garment, on the basis of which the fabric is cut. It is the technical drawing or drafting of a garment. Standard size charts, dress forms or figures are measured, these measurements are then converted into patterns and then garments are made from them.

What a Pattern maker does?

Apparel pattern maker plays an important role in the clothing industry. Individuals in this position are responsible for taking fashion designers ideas and creating a workable pattern that will ultimately become an article of clothing. Pattern makers often are required to more accurately define initial fashion designs and work closely with designers to achieve the desired look.

Patternmakers use their knowledge of fabrics, sewing skills and ability to alter garments to draft a pattern that replicates a design concept. If things go wrong at pattern making stage the fit will be spoiled and you will not achieve what is required, but with the effective knowledge of pattern making, you can always reduce errors which saves time and cost to the company, and is required to succeed in today's competitive environment.

Career growth driver for student

- Apparel demand at $ 78 Bn, dominating the domestic market with a share close to 4 per cent of the total textile and apparel market in India.
- Garments have continued to be the largest commodity exported out of India to EU with a share of 63 per cent of India's total exports. Some of the leading apparel brands are sourcing from India making India a promising sourcing destination.
- India has core strengths in cotton t-shirts, dresses, baby garments, underpants and briefs, synthetic dresses and tops for women which can be leveraged further.
- India has presence of complete value chain from fibre to fabric and hence the ability to execute even small order quantities.
- Rising per capita income, higher disposable incomes and preferences for brands.
- Organized retail landscape & e-Commerce.
- Increased focus on technical textiles due to growth of end-user industries such as automotive, healthcare, infrastructure and oil and petroleum

A good way to begin your pattern-making career is to acquire a position that is just below that of a pattern maker. For instance, include grader or fabric cutter. These positions will provide work experience and knowledge that is applicable for the pattern maker position.

- Production-Linked Incentive (PLI) Scheme in Man-made fiber and technical textiles with financial outlay of INR 10,683 cr under Atmanirbhar Bharat package.

Today, the textile and apparel industry in India is marked by radical innovation, shifting markets, evolving supply chains and distribution channels and is gradually drifting towards responsible and sustainable manufacturing. With the expanding of the industry, a lot of opportunity will be available for the skilled person.

Education and Skills Requirements

There are technical and vocational institutions that offer degree or certificate programs in pattern making. In addition, the Apparel Made-Ups and Home Furnishing Sector Skill Council (AMHSSC), which is an apex body for skill development and certification in the apparel domain, under the aegis of Ministry of Skill Development and Entrepreneur, has developed 'Qualification Packs' (QPs) aligning to International standards for pattern making job role. The council has aligned its skilling competencies with the industry requirements and is making an all-out effort in meeting the industry requirements for skilled and certified pattern makers with relevant technical capabilities, thus giving a boost to the growth of the sector along with creating employment opportunities for the youth of the country.

The Qualification Packs developed by the AMHSSC for Pattern maker job role are as follows:

- Pattern Master (NSQF Level - 5)
- Advance Pattern Maker (CAD – CAM) (NSQF Level -5)

AMHSSC has curated a variety of job-oriented industry-led QPs. According to the need of the hour, these programs are designed to generate employment for the youth and in addition retail segment is also bringing in new opportunities wherein these courses have great potential.

Key skills and interests

- To become a clothing pattern maker, you would require:
- A good knowledge of various types and properties of fabrics
- To be able to interpret a design concept and put it on paper
- Excellent sewing skills
- Good analytical skills
- Ability to draw freehand
- Awareness of current fashion trends

Career Prospects

A good way to begin your pattern-making career is to acquire a position that is just below that of a pattern maker. For instance, include grader or fabric cutter. These positions will provide work experience and knowledge that is applicable for the pattern maker position. In addition, you will be in a position to move directly into an available pattern maker opening, once you are ready. Top employment areas would be

- Apparel production house (export houses)
- Buying house
- Retail
- Design house
- Textile mills
- Overseas jobs on above areas
- Starting own business

Salary and Career Progression

At this stage, a skilled person can earn around Rs 15,000 monthly. With the experience and expertise, one's income can potentially increase. With formal education and experience, patternmakers can pursue careers as fashion designers, manufacturing managers and fit designers. Pattern makers are employed by apparel industry, fashion designer, and fashion consultant. It is an extremely rewarding, and challenging career that teaches great life as well as technical skills, and provides comfortable means of living. It's a challenging and rewarding job profile. EP

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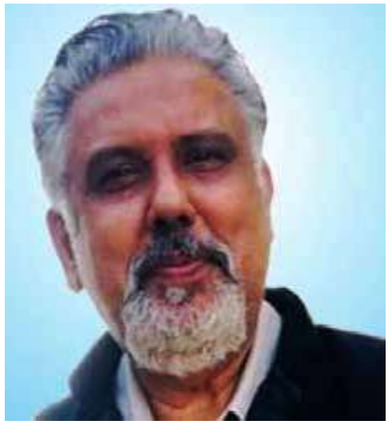

RAC INDUSTRY
A CAREER ALWAYS BE IN DEMAND

Piyush Chakraborty
Officiating Head,
Electronics Sector Skill Council of India (ESSCI)

Want to go into a career that will always be in demand? Consider Refrigeration and Air Condition (RAC). Because nearly every building has a climate control system comprising of the refrigeration and air conditioning, which will always be a great career with opportunity. RAC service technicians the RAC systems, figure out why it isn't working. It takes mechanical skill, technical aptitude, and practical knowledge. Every refrigerator or air conditioning repair requires the ability to look at the entire system and fix the problem.

The availability of skilled and certified manpower is the need of the hour across the ESDM sector especially the Air Conditioning and Refrigeration industry, which is expanding at a very fast pace. The industry requires the certified technicians to handle the Hydrochloric of luorocarbons Phase Out Management Plan (HPMP) as per the Montreal Protocol.

Need of Training Air Conditioning Technicians and Certifications

India has been witnessing high growth in the air-conditioning (AC) market which is expected to grow fivefold by 2030 from the existing stock of 35 million units. Refrigerants used in ACs are either Ozone Depleting Substances (ODS) or have extremely high global warming potential (GWP). Refrigerants leak out of ACs especially due to poor servicing practices by AC service technicians, causing adverse impacts to the environment. Of the 2, 00,000 estimated technicians in the country, the majority are semi or unskilled. Given that around 50% of refrigerant consumption is happening in the servicing sector, training of technicians on proper servicing practices to reduce leakages can have significant benefits. This training would also benefit technicians since the training would include safety practices and would increase their employability level within the formal sector.

In its way forward, the Electronics Sector Skills Council of India (ESSCI) which is an apex body for skill development and certification in the electronics sector, with the support of Ministry of Environment, Forest and Climate Controls interacted with the stake holders of the UN HCFC phase out action plan and developed 'Qualification Packs in Air Conditioning' with a Pan-India training ecosystem. The council has aligned its skilling capability to the industry requirements and is making an all-out effort in ensuring the industry requirements for skilled and certified AC technicians with relevant technical capabilities, thus giving a boost to the growth of the sector along with creating employment opportunities for the youth of the country.

ESSCI has over 400 training partners (TPs) having over 3200 training centers across the country. They are very well-equipped to undertake skill development across various job roles in all the segments of ESDM. The council has 160 Qualification Packs (QPs). Out of these, 200 training centers across the country are well-equipped to undertake training in the Air-Conditioning and Refrigeration job roles and also have the required infrastructure, tools and training competence.

Qualification Packs for the skill development

The SSC has numerous credible Qualification Packs for the skill development in this segment which have been closely developed with the support from the industries in the segment. The Qualification Packs creation also involves the assessment of the intrinsic demand for trained technical manpower in the industry in near future through Market Research and Industry's consultation. Some of the Qualification Packs developed by the ESSCI for the Air Conditioning and Refrigeration Industry are:

- Field Technician – AC (NSQF Level - 4)
- Field Technician – Refrigeration (NSQF Level - 4)
- Field Engineer – RACW (NSQF Level - 5)
- Functional Tester – RAC (NSQF Level - 4)
- Safety Tester – RACWO (NSQF Level - 3)
- Performance Tester – RACWO (NSQF Level - 4)
- HVAC Technician (NSQF Level - 4)

Skill Training of RAC Service Technicians under PMKVY

The Ministry of Environment Forest and Climate Change (MoEFCC) and Ministry of Skill Development and Entrepreneurship (MSDE) have agreed to jointly undertake up skilling and certification of 1,00,000 refrigeration and air-conditioning (RAC) service technicians on good servicing practices and knowledge of alternative refrigerants to ozone-depleting chemicals. The project is funded under the Skill India Mission - Pradhan Mantri Kaushal Vikas Yojana.

Role of RAC Technicians

Refrigeration and air conditioning mechanics install, maintain, repair and overhaul residential central air conditioning systems, commercial and industrial refrigeration and air conditioning systems, and combined heating, ventilation and cooling systems. As a Refrigeration/Air Conditioning Mechanic, one's duties may include:

- Installing, troubleshooting and overhauling entire heating, ventilation, air conditioning and refrigeration systems
- Measuring refrigeration and air conditioning components for installation
- Working with hand and power tools to install refrigeration and air conditioning components
- Measuring and cutting piping, and connecting piping using welding equipment
- Testing heating, ventilation, air conditioning and refrigeration systems for leaks
- Performing routine maintenance
- Repairing and replacing components for entire heating, ventilation, air conditioning and refrigeration systems
- Installing, maintaining and repairing equipment in refrigerated trucks
- Preparing work estimates

Skill Training Outcomes

Listed below are the few training outcomes:

- Better awareness of safety and environmental practices in RAC servicing by technicians.
- Reduced consumption of refrigerants among trained technicians
- Increased number of certified technicians who can seek employment in the formal sector

India has been witnessing high growth in the air-conditioning (AC) market which is expected to grow fivefold by 2030 from the existing stock of 35 million units. Refrigerants used in ACs are either Ozone Depleting Substances (ODS) or have extremely high global warming potential (GWP).

Job opportunity after skill training

Refrigeration and air conditioning mechanics install, maintain, repair and overhaul residential central air conditioning systems, commercial and industrial refrigeration and air conditioning systems, and combined heating, ventilation and cooling systems. Refrigeration and air conditioning jobs, however, will always be in demand. Reason being, nearly every building has a heating and air conditioning system. The RAC industry will continue to, provide a great career opportunity for individuals who enjoy working with people, have an aptitude for technical work and seek job security. RAC jobs will continue to exist in every community where there are people in buildings. Skilled one's can start their career as an employee or can start their own micro entrepreneur. RAC skilled people are employed by installation contractors, construction companies, food wholesalers, engineering firms and service establishments. It is an extremely rewarding, and challenging career that teaches one great life skills as well as technical skills, and allows you to make a comfortable living. EP

The ICFAI University, Jaipur

ICFAI UNIVERSITY

ADMISSIONS OPEN 2021

PROGRAMS OFFERED

UG Programs

B.Tech | B.Tech (LE) | BCA | BCA (DS) | BCA (AI & IOT)

B.Sc. (Hons.) Mathematics & Physics | BBA | B.Com (Hons.)

BBA-LL.B (Hons.) | BA-LL.B (Hons.) | LL.B

PG Programs

M.Tech | MCA | MBA

Doctoral Programs

Ph.D (Part-time) Management Studies

MERIT SCHOLARSHIPS based on performance in Class XII & Semester-wise

Highlights

- Fabulous Scholarships for the wards of Armed Forces
- On-campus, fully furnished, separate Hostels for Boys & Girls
- Excellent Career Oriented Academic Delivery and Placement Assistance
- Impressive Infrastructure including large Football and Cricket grounds
- Realtime Industry interface, Mentorship and Live projects

RANKINGS

IcfaiTech, Jaipur ranked:

- 4th in West Region (Govt. Pvt) & 25th all India in Top 100 Engineering Colleges -2020 (Govt. & Pvt.) - Silicon India.
- 2nd State wise among Top Engineering Colleges -2021 (Govt. Pvt) & Ranked 30th among Top Engineering Colleges of Excellence -2021 (Govt. & Pvt.) - Competition Success Review – GHRDC.
- 26th among Best Engineering Colleges in North India (2019) - India Today.
- Rated AA+ in Rajasthan among top Central / Deemed / State Pvt. Universities - 2020 - Careers 360.
- Rated AAAAA in Rajasthan among Top Pvt. Engineering Colleges -2020 - Digital Learning.

ICFAI Business School, Jaipur ranked:

- 7th among Top B-Schools of Excellence - GHRDC India's Best B Schools 2020 Rankings.
- 21st in A++ Category and 9th in North zone - Silicon India B-School Rankings 2021

ICFAI Law School, Jaipur ranked:

- Listed among "The 10 Most Leading Institutes in Law 2020" that are transforming the legal landscapes with their novel approach and exemplary expertise – The Knowledge Review Magazine.
- Ranked 24th among Top 50 Private Law Colleges – IIRF Rankings - Education Post Magazine 2020.
- Rated AA+ in State wise rating - Rajasthan (West Zone) - among India's Best Law Colleges (Govt. & Pvt.) - Careers360, 2021

Campus: Agra Road, Jamdoli, Near Cambay Golf Resort, Jaipur, Ph: 8094688800

For details & eligibility, please visit: www.iujaipur.edu.in

/iujaipur

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Ms. Shewani Nagpal
Chief Operating Officer
Rubber, Chemical and Petrochemical Skill Development Council

WHY SHOULD YOU CHOOSE THE CAREER IN RUBBER INDUSTRY?

Are you avid, dedicated, and passionate about solving problems? A career in the rubber industry might be right for you. Every day, you can direct your efforts toward solving problems with innovative ideas, improving products to enhance lives, and streamlining processes for success. If you are someone who loves to learn, a career in the rubber industry will offer you a fulfilling path. With technology advancing rapidly all the time, ongoing training means you always have the opportunity to learn something new and become better than before.

If you want to pursue a career in the rubber industry, the next step is setting yourself up with the right career training. Then, you can find an industry position and start putting those skills to work. If you're interested in pursuing a career in the rubber industry, you may be wondering where to start. Or, sometimes you have in mind why should you choose a career in the rubber industry. Let's talk here:

Why is there a career in the Rubber Sector?

Rubber has been used across the world from time immemorial. From humble beginnings of use as an eraser (suggested by noted explorer Magellan), today rubber is used across various industries like auto, aviation, healthcare, etc which drive the economy. With origins in Brazil, today rubber in its natural and synthetic forms is used globally. The significance of rubber in our world and daily lives is unmeasurable. It offers many important and varied career opportunities – from chemists/scientists, equipment operators, and engineers to quality control, sales & marketing personnel and everything in between. You have the chance to be a part of something truly extraordinary. Imagine what's possible!

According to the National Rubber Policy 2019 released by the Ministry of Commerce and Industry, India is the sixth largest natural rubber producer and second largest consumer in the world. With the development of India's economy, the consumption of rubber is gradually increasing day by day. According to market research firm 'India Brand Equity Research Foundation', automobile tyres consume around 50 percent of its total production and are followed by 15 percent tubes, 12 percent footwear, 7 percent latex, 6 percent belts, and pipes and 10 percent in other products/works.

The skilling landscape for the rubber sector has undergone significant changes.

With the increasing number of automobiles and the growing use of rubber in various industries, the rubber sector is becoming a lucrative career option for students. Our country is expected to be the leading automobile hub of the world in a decade or two, and hence the demand for skilled people will be high.

Education and Training Requirements

The skilling landscape for the rubber sector has undergone significant changes. Several factors have been have been attributed to this change; of course, the mainstay being the dynamic nature of the sector both in terms of the manufacturing process and technology. The rubber sector requires not only a pipeline of human resources skilled in equipment usage and various other basics but also the up-skilling of the personnel currently working in the sector. From extracting rubber to moulding it into synthetic rubber and making it useful, it has to go through different processes. From latex processing to rubber moulding, this requires special skills.

Rubber, Chemical and Petrochemical Sector Skill Council (RCPSDC) has been constituted under the aegis of National Skill Development Corporation (NSDC), in collaboration with All India Rubber Industries Association (AIRIA) and Automotive Tyre Manufacturers Association (ATMA), toidentify and fulfil skill development needs in the Rubber sector. It has developed numerous credible Qualification Packs for skill development in this segment. Apart from ITIs, Diploma holder, Science graduate, and postgraduate, many qualification packs are designed for secondary and senior secondary passed youth. RCPSDC also offers apprenticeship opportunities, where trainees get floor experience and learn the work culture of the industry.

Production workers in the rubber industry generally need a high school education, physical strength, and an aptitude for mechanical work. Most workers get their training on the job. A few colleges and universities offer special programs designed to prepare technicians and engineers for careers in the rubber industry. Some of these are cooperative programs that combine classroom instruction with on-the-job training.

Getting the career option

There are many opportunities to move ahead for workers with skills and experience. Those who start as helpers in jobs that require few special skills can advance to jobs operating complex machinery and supervising other workers. Other workers in the industry include managers, sales representatives, clerical personnel, technicians, and maintenance workers. In addition, chemists, chemical engineers, and mechanical engineers play an important role in designing and supervising the processes used to make rubber and rubber products. Many workers follow a single work pattern throughout the day and are under pressure to keep up with production schedules.

With the increasing number of automobiles and the growing use of rubber in various industries, the rubber sector is becoming a lucrative career option for students. Our country is expected to be the leading automobile hub of the world in a decade or two, and hence the demand for skilled people will be high.

Job Opportunities and Income

There are many rubber-based industries in the Southern part and they are facing a huge shortage of skilled people. For the skilled person, there are lots of opportunities in rubber industries, tyre industry, latex processing units, tyre re-treading industry, rubber moulding units, auto accessories companies, and some toy companies, where they can get a job. Apart from this, skilled candidates can also start their micro enterprises with the help of banks.

However, the income depends on the academic degree, training, and skills of the candidate. Usually, trained people get a monthly income of 15-20 thousand rupees in the initial phase. Gradually this income increases with the experience and goes up to five lakh rupees annually. EP

The ICFAI University, Dehradun
UGC Approved and NAAC Accredited
ICFAI UNIVERSITY

PROGRAMS OFFERED
B.Tech. | B.Tech. (LE) | BBA | BBA (FIA) | BCA | B.Ed.
B.Com (Hons.) | BA (Hons.) Economics | B.Sc. (Hons.) Mathematics
BBA-LL.B. (Hons.) | BA-LL.B. (Hons.) | LL.B. | LL.M.
M.Tech. | MBA | MCA | Ph.D (Mgmt. I Sci. & Tech I Edu. I Law)

HIGHLIGHTS
Highly qualified faculty, most of them are Ph.Ds with vast experience ▸ Smart board enabled classes with top of the line live teaching infrastructure ▸ A vast array of extra co-curricular activities such as music, arts, clubs, debating etc. ▸ Beautiful land scaped campus surrounded by hills and jungles ▸ A quality life with empaneled hostels around the campus ▸ Fully Wi-fi enabled campus ▸ Hi-Tech Innovative Labs ▸ Well stocked Digitalized library

RANKINGS

ICFAI University, Dehradun
- Ranked 1st among Top Private Universities in Uttarakhand and 46th at All India Rank (Private. Universities) - Education World University Rankings 2021.
- Ranked 13th in the Private University (Premier Category)- Indian Institutional Ranking Framework (IIRF) 2020-21.
- Ranked 34th among Top 50 - World's Universities with Real Impact (WURI) Rankings 2021 under Industrial Application.
- Ranked 45th among Top Universities in India and only University in Uttarakhand- Times Higher Education World University Ranking 2021.

ICFAI Business School
- Ranked 1st in Uttarakhand, 17th in North India and 35th in All India level among the Best B-Schools -IIRF 2020-21
- Ranked 1st in Uttarakhand and 17th in all over India among the Top B-Schools of Eminence - Competition Success Review-GHRDC B-School Survey 2020.
- Ranked 17th in A++ Category in All India and 7th in North Zone- Silicon India B-School Rankings, 2021.

ICFAI Tech School
- Ranked 1st among Top Engineering Colleges of Uttarakhand and 22nd among Top Engineering Colleges of Eminence - Competition Success Review - GHRDC - Engineering Rankings 2021.
- Ranked 4th in North India region and 13th in all India level- Silicon India 2020.
- Ranked 'AAA' among Private & Public Universities in Uttarakhand, India's Best Engineering Colleges- Careers 360, 2020.
- Ranked 'AAAA+' among Top Pvt. Engineering Institutes of Uttarakhand- Digital Learning 2020.

ICFAI Law School
- Awarded Himalayan State Educational Excellence Award-2020 for "The Best Law School of the Year" on January, 2021 at Dehradun International Science & Technology Festival - 3rd Himalayan State Educator's Summit.
- Ranked 1st among Top Law Schools in Uttarakhand (Govt. & Pvt. Law Schools)- Competition Success Review-GHRDC Survey 2021.
- Ranked 1st in Uttarakhand and 13th among Top Law Colleges (Private) in India - IIRF 2020-21.

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MERIT SCHOLARSHIPS | Based on qualifying examination & Semester-wise Performance
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Campus: Rajawala Road, Central Hope Town, Selaqui, Dehradun.

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SCHOOL OF ENGINEERING
DAYANANDA SAGAR UNIVERSITY

The School of Engineering at Dayananda Sagar University (DSU) was established in 2015, continuing the legacy of 60 yrs of the Dayananda Sagar Institutions pioneering in education and healthcare. The pillar of strength of the School of Engineering (SOE) is the specially chosen teaching faculty. SOE has the scholarly presence of a majority of the faculty with Ph.D from premier institutions like IISc, IITs and also from universities abroad. A sizable number of faculty members have a valuable experience in research organizations and industry from within India and abroad which directly translates to a rich learning experience for students.

The curriculum at SOE has been designed to bring in the content and best practices across the world. Majority of the courses have a hands-on and project component which largely enhances the problem solving skills in students. A notable feature of the learning experience of students is the in-house and industry summer internship opportunity for students. Students have an option to take up these internships at the very early stage of their Bachelors and Masters studies . SOE's collaboration with top universities and companies abroad also provide very exciting overseas internship opportunities for students.

Students have opportunities to work in industry defined problems right on-campus with the setting of research labs by top multinational companies such as Autodesk, Bosh Rexroth, Bosch ETAS, Analog Devices, Nvidia (for high performance computing), GE Healthcare lab etc. The state of the Art facility helps students to get into industry relevant research right during the undergraduate studies. These experiences give them an edge to get into Tier-1 companies and also for higher studies in the top universities within India and abroad.

Dayananda Sagar Entrepreneurship, Research and Business Incubation (DERBI) Foundation established in the campus is another unique opportunity for students to start their entrepreneurial journey right during their UG & PG studies.

A holistic personality development of a student encompasses a rich academic experience as well as the on the cultural front. The technical, cultural and sports clubs at SOE provide a platform for students to expand the horizon of their campus experience beyond academic studies.

In all, the school of engineering at DSU prepares students to build a valuable career with value system embedded all the way through the journey. EP

FWA

FEDERATION FOR WORLD ACADEMICS

Research Area | Training & Development | Corporate Trainings | Consultancy Projects | Information Dissemination | Skill Progress | Academic Community

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GOVERNING COUNCIL (2019 - 2021)

Dr. Irfan A. Rizvi
Professor, IMI
New Delhi

Prof. Simrit Kaur
Principal, SRCC
University of Delhi

Prof. Madhu Vij
Professor, FMS
University of Delhi

Prof. Ashish Joshi
Professor, City University
New York

Prof. Goutam Dutta
Professor
IIM, Ahmedabad

Prof. R. K. Shivpuri
Director, Intl. Relations
Mody University, Laxmangarh

Harjeet Khanduja
Vice-President, HR
Reliance Jio

Dr. S.M. Mohamed Ismail
Former Vice Chancellor of SEUSL &
Member of Parliament (National List),
Sri Lanka (2018–2020)

Dr. Sapna Popli
Professor
IMT Ghaziabad

Prof. Jayantha Lal Ratnasekera
Vice Chancellor
Uva Wellassa University

Shiv S. Sharma
Founder, Education Post
(Secretary, FWA)

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3, Bhikaji Cama Place, New Delhi-110066
Call us : 011-45604578, 8800306519
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Empowering Our Students To Become Next Generation Entrepreneurs

AIC-DSU Innovation Foundation

DEBI FOUNDATION ...Fueling Dreams

Innovation labs set up in the campus with assistance from:

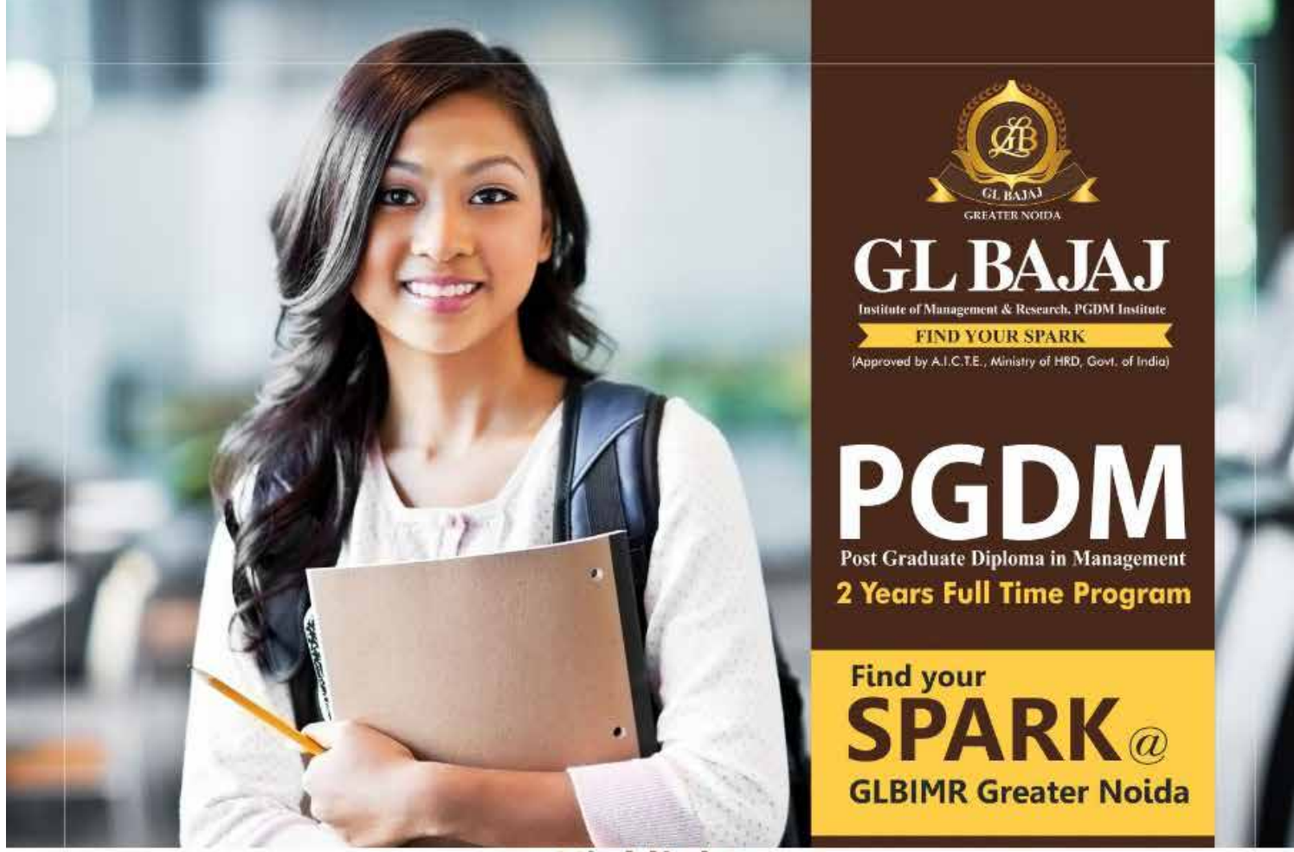
IBM, AUTODESK, rexroth A Bosch Company, NVIDIA, ANALOG DEVICES, DASSAULT SYSTEMES, vmware, GE Healthcare, BOSTON, ETAS BOSCH

Admissions Helpline: 080 46461800
E-mail: dsat@dsu.edu.in enquiry@dsu.edu.in

DSU Campus 1 :
School of Medicine Dr. Chandramma Dayananda Sagar Institute of Medical Education & Research Deverakaggalahalli, Kanakapura Road, Ramanagara Dt.,Karnataka - 562 112.

DSU Campus 2 :
Innovation Campus Main Admissions & Administrative Office, Kudlu Gate, Hosur Main Road, Bengaluru - 560114.

DSU City Admissions Office :
Gate 2, University Building, Dental Block, 6th Floor, Shavige Malleshwara Hills, Kumaraswamy Layout, Bengaluru - 560111



Highlights

10	943+	14773+	45740+
Institutes	Faculty	Students	Alumni

Awards, Accolades & Rankings

1st in Delhi/NCR and **2nd in North India** by **Business School Special**
BUSINESS STANDARD January 2021

3rd in Delhi/NCR and **3rd in North India** by **Top B-Schools** of **Super Excellence** and
4th in Delhi/NCR and **5th in North India** under Private Ranking of
Top B-Schools in **Uttar Pradesh (North Zone)**
Competition Success Review (CSR) November 2020

AA+ under Ratings of **India's Best B-Schools** in **North** India
Careers360 November 2020

8010-081-081 | www.glbimr.org

ADAMAS
UNIVERSITY

Nestled in a 120-acre, wi-fi enabled, green campus, under the guidance of the visionary Prof Samit Ray, Adamas University is a place with deep traditions focused on creating brighter futures.

A University With Schools For Every Interest & Delivers Courses With A Purpose

Rated as a top-ranked private university in East India, the vibrant 24x7 Adamas University offers students the option to choose from a range of 100+ industry ready and in-demand courses that are delivered via 10 specialist schools. Be it medical sciences, engineering, technology, law, business or liberal arts, the university provides undergraduate and graduate study opportunities that is aligned with current industry demands.

Balancing between popular programs like B.Pharm, B.Ed., LLB, Adamas delivers niche courses in Biotechnology, Artificial Intelligence & Machine Learning, Food Technology, Microbiology, Genetics, Psychology, Agriculture, Healthcare & Hospital Management, Digital Marketing that is the need of the hour to create a new breed to future-proof professionals.

Apeejay Stya University

UGC Recognised

India's 1st Industry-Centric Technology & Liberal Arts University focused on Research & Innovation™

Uninterrupted quality education at all times

ADMISSIONS OPEN 2021

Programmes Offered

- Engineering & Technology
- Management Sciences
- Journalism & Mass Communication
- Pharmaceutical Sciences
- Design & Visual Arts
- Education
- Biosciences
- Legal Studies

Key Highlights

- Several international collaborations
- Excellent placements
- Several merit-cum-means scholarships available
- Separate hostels for boys and girls with all modern facilities
- Transport facility available from key pick up points in Delhi NCR
- Excellent faculty including academicians with international experience

Awards & Accolades

- Conferred **Outstanding Private University of the Year** award at Global Education Summit & Awards 2021 by International Centre for Excellence in Education and Society for Perpetuation of Art, Culture & Education
- Awarded **Best University in Placements** at World HRD Congress 2021, presented by Times Ascent

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ASU Campus: Sohna-Palwal Road, Sohna-122103, Gurugram, Haryana
Toll Free: **1800-103-7888**
university.apeejay.edu

Apeejay Stya University is a social commitment of the Apeejay Stya Group

Adamas University is Transforming Education Through Multi-disciplinary Learning

The world is interconnected, and different disciplines interact and affect each other. The modern professional can no longer work or think in a silo - they need to have a far broader knowledge base.

In other words, the modern professional needs to experience multi-disciplinary learning which ensures the successful application of the knowledge gained.

Home to 120+ PhD scholars who teach full-time at the university, Adamas offers a personalised classroom experience and industry integrated curriculums. Be it Microbiology or Music, you can pursue both together at Adamas. In addition to this, students across different specialisations carry out multi-disciplinary research and tackle complex problems through collaborative efforts.

The Role Of Student Driven Research Fostering India's Future

Adamas University is a change-maker's mecca. This is an institution that encourages innovations that has the potential to shape the world.

Students have access to over 100+ top-of-the-line labs and the BOSCH Collaboration Center, one of the very few in the country, along with world-class facilities and resources. Research is encouraged, and in some courses, integrated. Adamas University has set up a detailed innovation and incubation center at the campus, making incubation a part of the university culture.

New Feathers In The Cap

An empanelled member of the West Bengal Government's Student Credit Scheme, Adamas University has gained a Platinum rating in Teaching & Learning, and a Diamond rating in Academic Development & Employability by the world-renowned QS I Gauge in 2021.

COLLEGE OF ENGINEERING
ROORKEE

The College of Engineering Roorkee (COER) is located in Roorkee, Uttarakhand on the Delhi-Dehradun National Highway-58, 7 kms from Roorkee. Roorkee is about 180 km north of Delhi and is known as the gateway town to the picturesque Himalayan Ranges. It has the famous Ganga canal, a civil engineering marvel of 19th century, passing throughit.

Founded by Seth Roshan Lal Jain Trust in 1998 as the first private Engineering College in Roorkee and the only engineering institution other than the famed University of Roorkee (now IIT Roorkee), COER grew by leaps and bounds in the past 22 years under visionary and dynamic leadership of its founder Chairman Er. J C Jain, a post graduate (M. E.) in Industrial Engineering from BITS Pilani (1971) and an eminent industrialist. The guiding principle at all times has been to establish standards of uncompromising excellence in teaching and research.

The COER campus is meticulously designed and built and presents a beautiful sight on the busy highway. Spread over 75 acres and draped in predominantly white exterior, the academic, administrative and residential buildings present a welcoming ambience to this temple of learning. Fully facilitated and ICT enabled classrooms, Laboratories, Computer Centre, Library, Hostels, Health Centre, Auditorium and Student Centre as well as Sports Complex with interspersed lush green vast spaces present a serene and calm learning environment.

To encourage self-evaluation which leads us to a better understanding of our own selves, our environment and our challenges; self study and continuous assessment is important. The objective has been to provide a holistic understanding of the multifarious college activities – both academic andextra-curricular.

Highlighting features of COER

- Highly qualified and experienced faculty having higher degrees from IITs andNITs.
- Gain a degree of a prestigious Government University (Uttarakhand Technical University)
- InternationalCollaborations
- Students encouraged to be associated with Research projects by Facultymembers
- Excellent infrastructure in a lush green campus of 75 Acres. All classrooms with modern teaching tools such as LCD projectors, WiFi access, spacious and well ventilated classrooms with comfortable furniture, all laboratories with state-of-art equipment, NABLaccredited laboratories in Plastics and Polymer Department, a rich Central Library, NPTEL Chapter with

more than 1000 online courses available, A unique state-of –art Centre of Excellence, A Do-it-yourself (DIY) lab open 24x7 for students to develop their ideas into functional projects, Design Innovation Lectures from IIT Roorkee, A 1000 seat Auditorium large Conference Halls, An exclusive placement department and Admission Department,Six Hostelsforboysandthreeforgirlshavingsing le-,double-seated rooms, AC rooms are also available, excellent indoor and outdoor sports facilities available, Each hostel is provided with a small hostel library for overnight issue of text books and a high speed reading room, college buses for outdoor industrial visits, 24x7 guarded and secured campus.

- Campus Placement Program round the year with more than 80% of the studentsplaced
- Holistic development of studentpersonality

ACADEMIC FACILITIES & LEARNING RESOURCES

The College of Engineering Roorkee has excellent learning levels of the students and organizes special Programmes for advanced learners and slow learners. The Institute organizes Orientation and Induction programs for the students at the commencement of the academic year for the new batch. The Orientation program is aimed at familiarizing students with the institution, curricular and co-curricular activities, facilities, rules and regulationsetc.

The academic philosophy of the College of Engineering Roorkee is student centric. Various methods of experiential and participatory learning are adopted to ensure that students are active participants rather than passive listeners in the teaching-learningprocess.

The Institute Do It Yourself (DIY) lab for students of Engineering is a platform provided to the students that supports them financially and technically for promoting their innovative ideas that enhances their learning experiences. This has helped the students getting selectedand achieving success in national and international contests like Cognizance (IIT Roorkee), SAE Events, Smart India Hackathon and such othercompetitions.

The participative learning provides students with an opportunity to gain professional values, knowledge, and skills. It helps in developing an application based outlook among them. To further support and develop experiential and participative learning following activities are adopted:

- Field visits, Workshops, Industry Internship Programs, Seminars, Guest Lectures, Conferences
- Live Projects, MinorProjects
- Group discussions, CaseAnalysis
- Term Papers, Home Assignments,Tutorials
- VirtualLaboratory
- Presentations
- Do It Yourself (DIY)Projects
- Soft skill programs, Value Added Program (VAP), Skill EnhancementPrograms
- Institution is having tie up with design innovation center(DIC) with rethink the Tinkering Lab,IIT
- Roorkee for developing design and innovation as a culture in our institution and participation of student in variousworkshops.
- Students and staff are having free access to online courses offered by NPTEL, available inlibrary.
- Reasoning/Quantitative AptitudgeLectures
- Exercise for improving Problem SolvingSkills
- Design thinkingworkshops

The College gives high importance to holistic development of students beyond classroom through co-curricular, extra-curricular and field based activities. In order to pursue the interest in their area of specialization, student's committees/Clubs are formed:

- Oorja- The CulturalCommittee
- SPIC MACAY – The Indian Culture andMusic
- Disha- The TechnicalCommittee
- Robotics Club – Designing Roboticprojects
- The Robotic and Innovation Club(TRAIC)
- SAE Club – Designing, fabricating sports cars and participating in motorsports
- COER Aero Club- Projects onAeronautics

- Literary committee – for sharpening literaryskills
- LinguisticCommittee–for sharpening communication skills
- Entrepreneurship Club–for encouraging startups initiatives
- Eco club – Promoting ecofriendliness
- Karuna Club – Service tosociety
- Praharsh- Spreading happiness among weaker section ofsociety

To facilitate teaching-learning process, the college makes use of Information & Communication Technology (ICT), Outcome Based Learning (OBL), Problem Based Learning, Student Centered Learning, Massive Open Online Course (MOOC).

INFORMATION & COMMUNICATION TECHNOLOGY (ICT)

The classrooms of Institution are well equipped with LCD projectors and faculty is provided with Digital note pads for effective learning process. The Institution has fully wi-fi enabled campus such that video lectures, virtual labs, interactive sessions are also being practiced during lecture hours when required. It allows students to understand subjects from different perspectives in a convenient and effective manner. Online Courses: Students are also encouraged to join the Open Online Courses (MOOCs) like NPTEL, Coursera etc. Learning management system (LMS) is another initiative by the faculty members. Using this too faculty may connect with the students and vice-versa. Tutorials assignments, quiz can be managed using thistool.

RESEARCH, INNOVATIONS AND EXTENSION

Research is the most important aspect for any engineering institute. COER takes pride in continuously thriving for research and development activities undertaken by its faculty and students. COER has a unique tradition of fostering and sustaining the research environment. The students are given to investigate research oriented mini and major projects. COER has undertaken various research programs in the field of renewable energy. Multidisciplinary research is our vision and strategy to address the diverse, complex and demanding problems of today's society. R&D activities are organized under government/private agencies such as TEQIP, Government of India. All ten sponsored projects at COER have been published patents. We also have collaborations with other research and academic institutes.

INFRASTRUCTURE

Various infrastructural facilities and amenities offered by this institute are seminar halls, conference rooms, ATM, 6 boys hostels and 2 girls hostels with facilities including mess, student center, medical facilities, sports, free Wi Fi etc. Institute is having various advanced laboratories such as Plastic and Polymer Lab, IBM Software Lab for Emerging Technologies, High performance Computing Lab, Computer Centre, CAD-CAM for Civil Engineering, CAD-CAM for Mechanical Engineering, Digital Communication Lab, PCB Lab,ElectricalProjectLab,aWi-fienabledstudyroominhostels,library,Conferenceand

Board Rooms, Incubation Center, Sports Center and Gymnasium for students to foster overall growth. To encourage COERians in the field of innovation, to identify their hidden talents and hone their skills, Institute introduced DIY (Do It Yourself) platform and Centers of Excellence (CoE) where students can work24x7.

COER is also having Incubation Center and Entrepreneurship Development Cell to provide guidance to students for incubation and start ups. Both cells organize boot camps, idea generation competition, workshops etc. for promoting incubation and start ups.

PLACEMENTS

COERians as an output of all above are placed in top multinational companies. The training and placement cell is continuously working for the same and as a result, the more than 80% of the students are placed every year. EP

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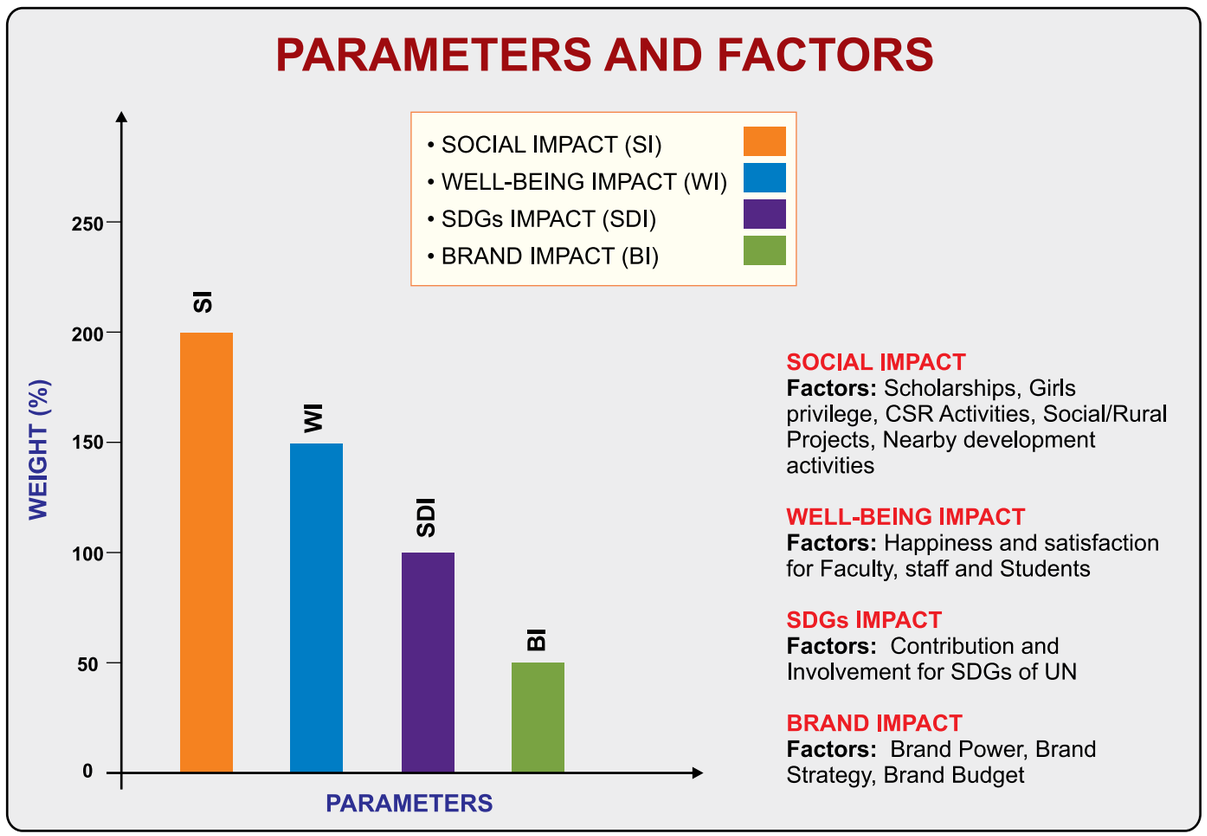

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S.D.M. COLLEGE OF ENGINEERING AND TECHNOLOGY

DHARWAD

Shri Dharmasthala Manjunatheshwara College of Engineering and Technology, Dharwad is one of the premier Engineering Institution imparting technical education under the flagship of the SDM Educational Society. SDME Society runs more than 45 premier academic and professional Institutions spread across Karnataka under the able guidance of its distinguished president Dr. D.VEERENDRA HEGGADE, Dharmadhikari of Shri Kshethra Dharmasthala.

SDMCET was established in 1979 with its humble beginning in three Engineering branches in Electrical, Mechanical and Civil with a total intake of 90 students and has grown into one of the nationally acclaimed Technical Institutions of the country. At present it has 7 UG programs, 6 PG programs and MBA program. All 11departments have been recognized as Research centers for offering Ph.D. by VTU, Belagavi. The Institution is consistently ranked high amongst Private Engineering colleges of the country. Institution is placed in the band of 200-250 in MHRDS 's NIRF Ranking 2020.

SDMCET is engaged in imparting quality education through innovative teaching and learningprocess, best practices and providing support to research and developmental activities. The high quality academic ambience is created and managed by the competent, dedicated and committed faculty members, with more than 75 Ph.D holders, well supported by the managerial and supporting staff. With its unique and innovative practices and initiatives, the Institution has received Academic Autonomy by UGC, New Delhi and Visvesvaraya Technological University, Belagavi.

Dr. D. Veerendra Heggade
President, SDME Society

The Institution has signed more than 10 MoUs with Institutions and Industries of high repute both in India and abroad. SDMCET has received more than Rs. 4.5 crores so far from various funding agencies for the research and development work. SDMCET Startup Cell has several companies like Haritza and HAEGEL incubated in the campus. Development Centre from Mind Craft Technologies is stationed in the campus. The Institution has excellent Placement Record coupled with multiple opportunities.

Major recruiters are Accenture, Oracle, Dell, TCS, Mercedes Benz, Cognizant, Bosch, KPIT.. etc. and for 2020-21 batch, so for 112 MNC companies have participated in the placement drive and 519 job offers were given with a highest package of Rs.40 LPA. Mr. Ankitkumar of 2020 batch has bagged record package of Rs.62 LPA which is at par with the packages of any premier IITs and NITs.

Institute has gained very good rankings as per the surveys made by various prestigious ranking agencies of our Country.

Times Engineering has identified the Institute as -37thamong Top 175 Engineering Institutes Rankings 2021 in India & 28th among Top 125 Private Engineering Institutes.

Education World has identified the Institute as 52nd among India's Top 100 Private Engineering Colleges & 11th Top Private Engineering Institutes in Karnataka and top place in North Karnataka

Competition Success Review -5th among Top College of Eminence in India 2020-21 & 1st among Top 7 Engineering Colleges Ranked by State.

SDM Institute of Technology (SDMIT), Ujire focuses on promoting quality technical education in rural region, to bring in a paradigm shift among the rural community. The institute is running 6 BE courses and has 6 VTU approved Research Centres in various departments to pursue Ph.D/ M.Sc. studies. To improve employability and to support students in start-up ventures, the college has established Bosch-Rexroth Centre of Excellence, Texas Instruments Innovation Centre, Wipro Mission 10x Learning Centre, K-Tech NAIN Incubation Centre of Govt. of Karnataka, SELCO Incubation Centre, Innovation and Entrepreneurship Development Centre (IEDC), IIT Bombay Remote Study Centre, Nodal Centre for IIRS-ISRO Outreach Programme, and is engaging the students in the above learning centres beyond the regular curriculum.

SDM institutions are famed for the signature aura of formal learning combined with spirituality, cultural orientation and stern social responsibility. The factors distinguish us as one of the leading education providers in the country, creating a distinct set of graduates who have been accomplishing milestones in every area one can contemplate. EP

MATHEMATICS CHALLENGE

CMT - SERIES PROBLEMS - by GANIT MATH (गणित मठ)

- composed by -
Teachers' Teacher , Maths Wizard

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CMT-2020/ 19 :

For $x>1$, $y>2$, $m\neq 0$, and, $a\neq b\neq c$,

$$If\ x+1\div\left[x+1\div\left\{x+1\div\left(x+1\div\overline{x+\frac{1}{x}}\right)\right\}\right]=\frac{1189}{360};$$

$$y-1\div\left[y-1\div\left\{y-1\div\left(y-1\div\overline{y-\frac{1}{y}}\right)\right\}\right]=\frac{2911}{780};$$

$$\frac{z}{2}=\frac{1}{1+m^{(a-b)}+m^{(c-b)}}+\frac{1}{1+m^{(b-a)}+m^{(c-a)}}+\frac{1}{1+m^{(a-c)}+m^{(b-c)}};$$

$$px+qy+rz=rx+py+qz=147;$$

$$qx+ry+pz=165;$$

then,

$$\frac{p^3(q-r)+q^3(r-p)+r^3(p-q)}{p^2q-p^2r+q^2r-q^2p+r^2p-r^2q}=?$$

CMT-2020/ 20 :

For $xy>0$ and $(uv)\in R^+$; if

$m=u^7+v^7$, and, $n=x^{12}+y^{16}+x^{20}+y^{24}+\ldots+x^{132}$, where,

$$u^{16}v^{16}+6u^8v^8-7=4\left\{\left(u^4v^4+1\right)^2-4\right\};$$

$$(u-v)^2-6(u+v)+13=0;$$

$$x^{16}+y^{-16}+4\left(x^8+y^{-8}+1\right)=2\left(x^8y^{-8}+4x^4y^{-4}+2\right);$$

and, $x^{81}+y^{81}=\sqrt{2}$; then,

$$\frac{3m+n^5+n^4+n^3+n^2+1}{n^{15}+n^{14}+n^{13}+n^{12}+4m-842}=?$$

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If $x^2+y^2=\alpha$ and $xy=\beta$, then find the value of : $x^{16}+y^{16}$, $x^{15}+y^{15}$, and, $x^{12}+y^{12}$ in terms of α and β in the simplest form.

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ANSWERS : CMT-2020/17: 51 ; CMT-2020/18: 51

Answers will be published in the next issue . You can ask any queries and send your solution to
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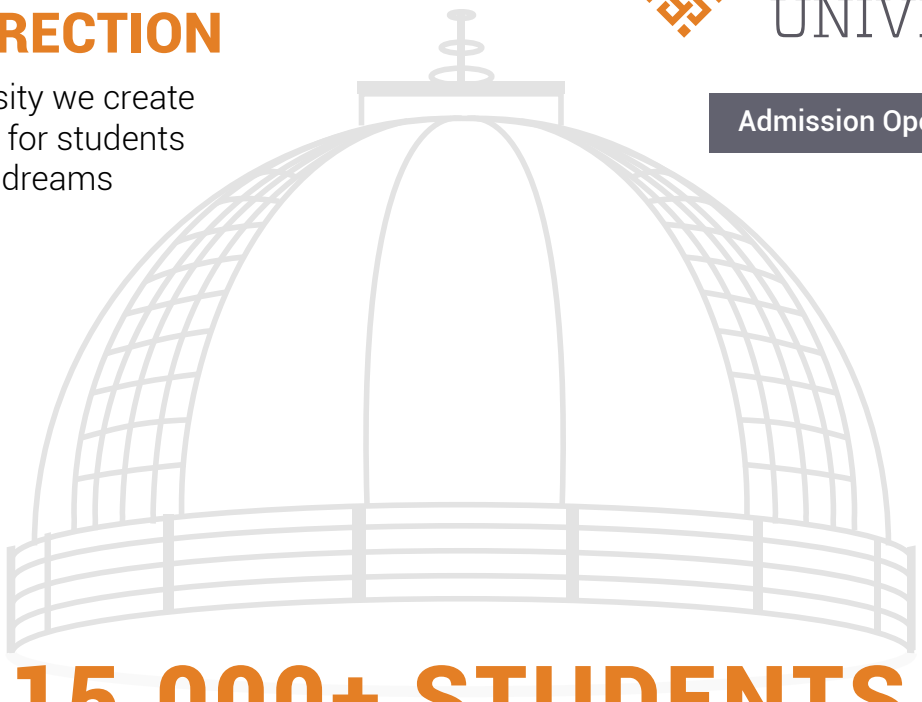

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