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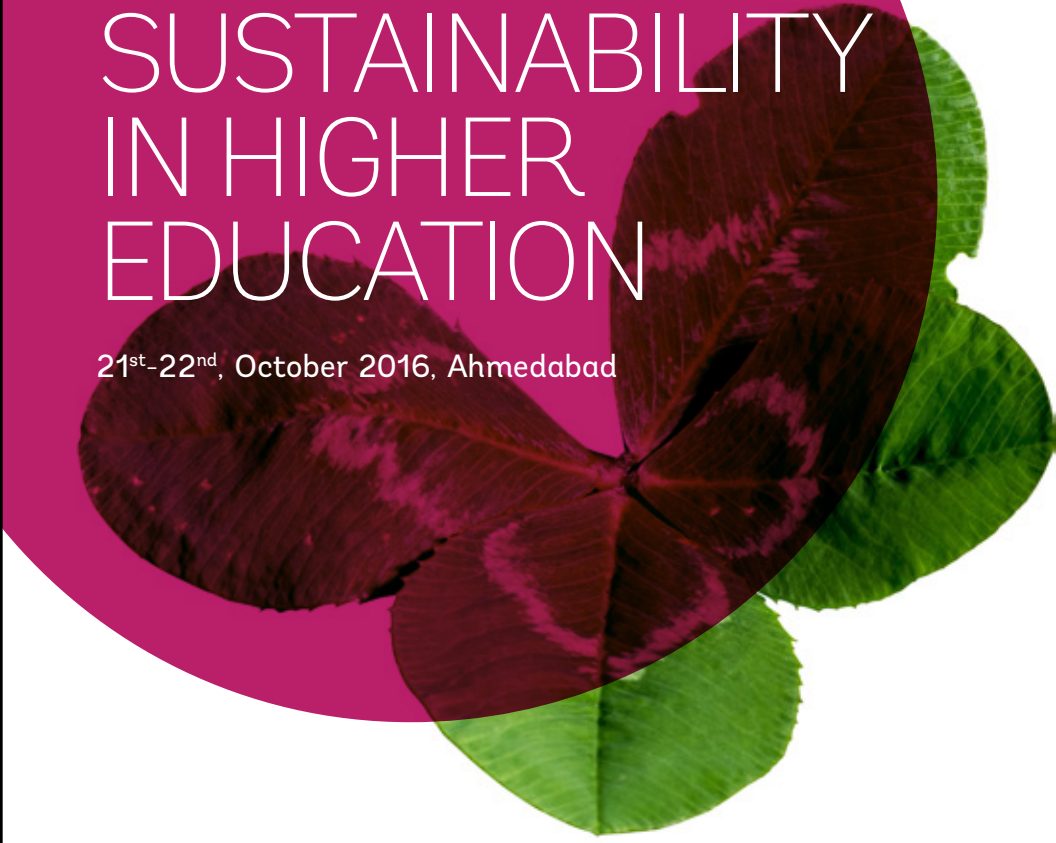
SELECT CONVERSATIONS
FROM THE WESTERN REGION
SUSTAINABILITY SYMPOSIUM

SUSTAINABILITY IN HIGHER EDUCATION

21st-22nd, October 2016, Ahmedabad



PARTNERS

CEPT UNIVERSITY

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Wipro Ltd. (NYSE:WIT) is a leading Information Technology, Consulting and Business Process Management company that delivers solutions to enable its clients do business better. Wipro delivers winning business outcomes through its deep industry experience and a 360 degree view of "Business through Technology" – helping clients create successful and adaptive businesses. A company recognized globally for its comprehen- sive portfolio of services, a practitioner's approach to delivering innovation, and an organization wide commitment to sustainability, Wipro has a workforce of over 150,000 serving clients in 175+ cities across 6 continents. Wipro started its formal sustainability journey more than a decade back with 'Wipro Cares', our community care trust that works with community on primary health care, inclusive education, environment and disaster rehabilitation, followed by 'Wipro Applying Thought in Schools' (WATIS), an initia- tive that addresses issues of systemic reforms in school education, and 'Mission10X', a not for profit initiative with the objective of increasing the employability of graduate engineers. Over the years, these programs have expanded in scope and scale and simultaneously, while other significant initiatives got added around ecology, workplace, employee engagement, customer stewardship, and suppliers.

Over the last decade, we have set up the momentum for a corporation wide sustainability program at Wipro that involves employees, customers, suppliers, investors, the government, communities and the education system. As part of this charter, we have defined some very aspirational goals on dimensions like GHG emission reduction, Water, Waste, Biodiversity, People Diversity and the Supply Chain.

At Wipro, we have endeavored to work on both the educational challenges in schools and colleges and on ecological sustainability issues, both, within our organization and outside. From our work in these areas came this realization that sustainability issues require greater atten- tion in the education system. This was the genesis of earthian which is WIPRO's Sus- tainability Education Program. It is a nation-wide program, the first edition of which was launched in April 2011 through which we have reached out to more than 3000 schools and colleges, 3500 educators and 15000 students since inception. The core focus of this engagement is of driving sustainability thinking and action through the learning process in participating schools and colleges by providing faculty and students, rich and diverse experiences.

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FOREWORD

Critical sustainability challenges including climate change, resource extraction and water scarcity are at the center stage of world attention. This has resulted in concerted efforts worldwide to deal with these challenges using medley of crosscutting global treaties and binding commitments. While such conversations form the backdrop for a slew of initiatives and policy decisions by nations and the civil society at large, it is imperative that the corporate world and educational institutions join this narrative by identifying creative intersections of the work in their respective roles. The educational sector in particular plays a critical role both as a fountainhead of new ideas and innovations and as an enabler of social and ecological change. It is now well accepted that sustainability issues cannot be adequately addressed without driving sustainability thinking and action through the learning process. Strengthening a holistic thinking at the formative years of an individual's development will go a long way in ensuring that collectively as a society we integrate sustainability solutions rather than dealing with problems post-facto. Higher education in particular is at the vanguard of this movement. Its close alignment with milieu of our times, the ability to integrate value based thinking, embrace fresh paradigms, and nurture leaders for the future makes it an ideal platform for leading the transition to a sustainable world.

It is with this overarching perspective in mind that seven years back we started Wipro- earthian, a nation-wide sustainability education program that engages with colleges and schools in addressing some of these big questions before us. Our endeavor through Wipro-earthian is to create a platform that will enable different stakeholders in the higher education ecosystem to come together and to co-create new pathways in sustainability education.

Against this backdrop it was felt that the time was right to steward this whole movement forward in a more strategically directed manner. As a part of WIPRO's long term vision to further sustainability education in India, WIPRO along with our partner institutes (CEPT, IIMA, ICT, NID, IITB) hosted and curated a 2 day multi-disciplinary 'Western Region Symposium' of leading institutes from western India on the topic of 'Sustainability in Higher Education' which aimed to bring together academics, highlight specific case studies, promote larger advocacy and nurture the potentially transformative role that integrating sustainability education can play in multiple disciplines.

The rich content and perspectives that emerged from this gathering of minds exceeded our initial expectations. Besides analyzing and deliberating on curricular developments in Design, Engineering, Planning and Management schools, the speakers at the forum also highlighted best practices in teaching sustainability. It was also a platform for faculty to share their experiences and brought to the fore, several interesting initiatives that would otherwise have not been visible to peer groups.

This forum has created a strong impact by building organizational synergies and setting up the foundation for a larger multi-disciplinary network of sustainability educators across the western region. At Wipro we strongly believe that these very institutions can play the role of nodal centers disseminating critical learnings and knowledge over time. As a result of our interactions at the forum, a collaborative process of building knowledge repositories across disciplines is already underway. We intend to build on this initiative in the coming years and take forward these discussions to a logical end- the challenge of infusing sustainability ideas, concepts and practices into the curricula of institutions of higher education. Its is our belief that co-creating and catalyzing such platforms will lead to something substantive on an ongoing basis.

This is a progressive first step in the right direction. We are in the early stages of a journey that promises to be as exciting as it will be challenging. But we are optimistic that leading academic institutions from across disciplines will come forward in pioneering new paths and in co-creating the change we all want.

01 **DAY**

SPEAKERS

Symposium opening remarks

SESSION 1:

Plenary: Integrating sustainability in education

SESSION 2:

Master Class 1- Sustainability and Habitat Education

Master Class 2- Engineering for Change

Master Class 3- Wicked Issues to Wicked Opportunities/
Design thinking to address complex Sustainability Challenges

02 **DAY**

SESSION 1:

Student Presentations

SESSION 2:

Panel Discussion: Challenges and Best Practices:
Learning from experiences

SESSION 3:

Open session: Setting the agenda -Next steps and Closing Remarks

THINKING OUT LOUD

Quotes

SPEAKERS

01 **Vidyadhar Phatak**
Faculty of Planning, Centre for Environmental Planning and Technology University (CEPT)

02. **Aniruddha Pandit**
Institute of Chemical Technology

03. **G Raghuram**
Public Systems Group, Indian Institute of Management Ahmedabad (IIMA)

04. **Shashank Mehta**
National Institute of Design (NID)

05. **P S Narayan**
Wipro Sustainability Group

06. **Mona Iyer**
Faculty of Planning, Centre for Environmental Planning and Technology University (CEPT)

07. **Jai Thakkar**
Faculty of Design, Centre for Environmental Planning and Technology University (CEPT)

08. **Urvi Desai**
Faculty of Architecture, Centre for Environmental Planning and Technology University (CEPT)

09. **Bakul Rao**
IIT, Bombay/ CTARA (Centre for Technology Alternatives for Rural Areas)

10. **Praveen Nahar**
Industrial Design, National Institute of Design (NID)

11. **Mayank Loonkar**
Communication Design, National Institute of Design (NID)

12. **Nirja Mattoo**
Centre for Development of Corporate Citizenship, SP Jain Institute of Management and Research) SPJIMR

13. **Ranjini Swamy**
Organizational Behaviour, Goa Institute of Management (GIM)

14. **Prakash Rao**
Energy and Environment Department, Symbiosis Institute of International Business (SIIB)

15. **Shambu Prasad**
Strategy & Policy, Institute of Rural Management Anand (IRMA)

16. **Ram Mohana Turaga**
Public Systems Group, Indian Institute of Management Ahmedabad (IIMA)

SYMPOSIUM OPENING REMARKS

Abhijit Zacharia

Wipro, for a while now, has been driving initiatives in the area of sustainability education. It's been in our DNA from the outset, when the larger sustainability programme started five-six years ago. Simultaneously, we kick-started the Wipro Earthian programme – Wipro's sustainability edu- cation programme for schools and colleges which is part of our effort to strengthen sustainability thinking and action in the learning process for school and higher education. The Western Region Sustainability Symposium is a part of our larger effort to make sustainability thinking integral to education and build institutional commitment.

This is a unique symposium in the sense that we have been able to bring together educators from multiple disciplines across the western region on a single platform on the theme of sustainability education. We hope that the deliberations during the next two days will give us an opportunity to understand the challenges and best practices in sustainability education in this region and in India. It is at a very nascent stage, and we hope that sustainability educators like you will be able to strengthen this platform henceforth.

P S Narayan

In this plenary session we have four very distinguished speakers who will share their thoughts on the broader theme of sustainability in education. Before that, it will be useful to set the context for this conference the way we have been looking at it.

The Global Risk Report is released every year at the World Economic Forum in Davos, and **the 2016 report talks about the top ten risks both in terms of likelihood and impact. The interesting thing about this listing is that most of the risks are either environmental or social or geopolitical.** So we have things like failure of climate change adaptation, water crisis, energy price shocks, biodiversity loss, social instability and so on.

If you go back to the Risk Reports of the last seven to ten years, you will find these kinds of risks appearing in some form or the other. And that's what makes it interesting, because if you go back to the report of, say, 15 or 20 years back, the risks would have been very different. They would have been primarily business risks – economic risks, forex fluctuations, oil prices... While these continue to find an important place, they are now accompanied by social, environmental and geopolitical risks.

The fact that this appears every year at the World Economic Forum, which really represents a coming together of global interests in business, shows that there is a transition we are currently in the middle of and which

business is trying to recognize. The question for business is that although on one hand there has been this unprecedented progress over the last 200 years, economically speaking – a very, very sharp rise in GDP per capita – at the same time, many social scientists are trying to see whether we have made the same kind of progress from integrated social perspectives.

One of them is something called the General Progress Indicator (GPI). When placed against GDP, the GPI seems to be sort of flattening, or even declining. The GPI consists of several index components, a lot of it to do with environmental pollution and climate change, but also social indicators – unemployment, automobile accidents and so on. Therefore, I think, this question is probably at the heart of the way things are going on currently: Is the fork in the road something that is inevitable, or can we forge a path that merges all the interests? Does it have to be economic growth or sustainable growth? Does there have to be that kind of dichotomy?

Wipro Earthian is a programme of ours which tries to bring some of these interests together under the realm of education. Our long experience of ed- ucation – **we have been working in it for more than 15 years with schools, and more recently, with sustainability – helped us realize that many of the problems of sustainable development are probably a result of our inad- equate or inappropriate education systems** – what is learnt, what is not learnt, what is ignored, what is paid attention to...

That is what led us to start Wipro Earthian, which is a long-term intervention seeking to make sustainability axiomatic to education. It is an annual programme, where we invite schools and colleges to participate. Every year we work closely with about ten schools and ten colleges on long-term in- terventions. As part of this continuing engagement, we have been trying to work with colleges with different disciplines. We are trying to see how to embed and expand the role that sustainability can play. Sustainability is a very broad term. It means different things to different disciplines, to different streams of thought. But within this context – the disciplinary context – how do we strengthen the role of sustainability? That is how the genesis of this conference was also born.

So what are the elements of sustainability education? That is something all of you are better qualified to discuss and debate. From what we have observed and what we have learnt from practitioners, from academics, there are several elements to it. The first is the system's ability to see the larger picture. If you look at the four dimensions of energy, water, food and climate change, you can see that they are all interconnected. Leveraging one, or touching one, will affect the others. Take energy, for example, and water. The fact that electricity has been subsidized for many years now is one of the reasons why groundwater extraction has become unsustainable. Also, a lot of energy production technologies require a lot of water.

So there is a nexus between energy, water, food and climate change. And this nexus is often very intricate and interconnected. To understand this kind of complexity is to understand that many things are interconnected – that the behaviour and properties of the whole may be entirely different from that of its constituents, or the emergent properties, as they are called in systems thinking. Or that a small change or divergence between two similar starting points can result in end states that are very, very

different.
Sustainability, therefore, has multiple dimensions. There is an intellect, there is sensibility and there is sensitivity. So it requires the coming together of the cognitive, the ethical and the aesthetic. Take the very com- monplace example of green or sustainable buildings. The cognitive dimension understands very well the role of higher energy efficiency or higher resource efficiency in buildings, and the fact that you can derive a lot of operating savings from that. But it requires a certain sensibility to differentiate between positive conscious architecture and static architecture, even though both may be equally energy or resource efficient. And there is a sort of sensitivity that has to come to play, for example, in ensuring that during the construction phase workers are paid fair wages, and have ac- cess to decent transit shelters, water and sanitation and so on. The social footprint of the building is as important as the environmental footprint.

The third element is, how do we transition the role of economics from a conventional position where ecosystems are a part of the larger human economy, to one where human economy is embedded in larger ecosystems, and therefore the understanding that capital, value and wealth are not just economic, but also ecological, also social? So you may strengthen it and have an economic capital, but end up depleting ecological capital, or end up depleting social capital, or the other way round. So how do you strengthen all the three and bring all the three together in resonance? This is a very fundamental challenge.

We are seeing change beginning to happen. For example, if you look at the whole ecosystem of waste, we are seeing that from the conventional model of recycling through rethinking, to redesigning circular models – from the linear process of take-make-dispose to a circular model where we try to ensure that the materials or elements are upcycled as continuously as possible.

There is the famous framework of 'cradle to cradle' which tries to take these models from natural systems and says waste must be equal to food, or the focus must shift from efficiency to effectiveness, and diversity must be a primary principle of design. A lot of work is going on here and we are aware that institutes like NID (National Institute of Design) are also doing some pioneering work in this. Some of the early results are very interesting and promising. For example, **the cost of a re-manufactured mobile phone can be nearly 50 per cent less, with overall savings of more than $ 2 billion per annum in materials and energy costs.**

This is not in just one product category. We are seeing this across categories – washing machines, light commercial vehicles, and so on. And the payoffs are not just economic. They are environmental, and social. For example, a washing machine which moves from an ownership model to a lease based model can have a 20-year life cycle, and that can result in a saving of 180 kg of steel and 21/2 tons of carbon dioxide equivalent per consumer, per washing machine. That's really significant.

A circular model can also help create thousands of new jobs because you need new models of reversed logistics, refurbishment of business cycles and so on. One estimate says that in the tertiary sector the labour

intensity of a circular model is much higher than the capital intensity, and therefore results in lots of new jobs being created.
With sustainability in education, while its primary importance is not disputed, the challenges are many – something that you will understand better. Many of the issues are wicked problems, and one of the master classes today focuses on this. And because sustainability issues are so inter-disciplinary, how do you address the nature of these wicked problems where the boundaries between the known and the unknown keep changing? Sometimes, the more that is known, the more unknowns emerge. How do you, therefore, bring together disciplines from across natural sciences and social sciences to foster a better understanding of sustainability?

This kind of change has to happen at multiple levels. It has to happen in terms of scaling, or innovation, or governance. For example, in innovation, on one hand you need breakthrough research, for example in green chemistry. On the other hand, you also need process innovation – like a better design of public transport systems – or scaling. How can you have a large scale but decentralized delivery of primary healthcare interventions, such as a low-energy, low-cost refrigerator for storing vaccines?

In governance, you need different hybrid models. On one hand, you need government funded research on primary resources. But you also need market models. And equally, you need citizen led local governance models. How do you blend all of them together?

So, changes have to happen at multiple levels and in different modes. These are some of the basic challenges that sustainability and sustainability education require. If this is the new normal, the new normal requires new ways of seeing. How business, government, civil society and academia come to- gether in new configurations is going to determine whether the status quo continues, whether there is flourishing, or whether there is decline.

Let me end this by articulating two quotes from two eminent persons of the 20th century. Einstein said, "We cannot solve our problems with the same level of thinking that created them." So we need a different level of thinking. And Proust said, "The real voyage of discovery consists not in seeking new landscapes but in having new eyes." Therefore, one of the primary tasks of sustainability education is to enable students and practitioners to see things differently – to have new eyes.

SESSION 01

PLENARY:
INTEGRATING SUSTAINABILITY IN EDUCATION

Vidyadhar Phatak
Dean, Faculty of Planning, CEPT

Aniruddha Pandit
Dean, Institute of Chemical Technology

G Raghuram
Chairperson of Public Systems Group, IIMA

Shashank Mehta
Activity Chairperson, Education, NID

P S Narayan
Head, Sustainability at Wipro

P S Narayan
Professor Vidyadhar Phatak is one of the leading urban planners in the country, with over 40 years of professional experience. He has conducted significant research on issues of housing affordability, public land, land based fiscal tools, and reforming urban planning. Prof. Phatak retired from the Mumbai Metropolitan Region Development Authority – MMRDA – as its Principal Chief, Town and Country Planning Division. Since then, he has been an independent urban planning analyst and consultant. He was a director of the National Housing Bank from 2006 to 2012, post which he served as an advisor to MCGM (Municipal Corporation of Greater Mumbai) for their regional development plan. He has also been a member of the Planning Commission task force for urban development and the National Commission on Urbanisation. He is currently Dean at CEPT University, Ahmedabad.

Vidyadhar Phatak:
You must have noticed from the introduction that I am very new to academics. So I don't have anything very profound to say about how sustain- ability could be brought into higher education. What I intend to do is to say a few things about how CEPT currently looks at sustainability issues, and what the challenges are that I personally perceive and foresee in terms of integrating sustainability into education on planning.

CEPT began in 1962 as a school of architecture. But even in that period, the name indicated that it would be a part of the Centre for Environmental Planning and Technology. So it recognized the significance of environment as well as technology. In 2005 became a university with five faculties: Design, Architecture, Planning, Technology and Management – Management of Habitat. So it covers a wide scale in terms of what it looks at: design at the smaller scale; architecture in the built environment; planning – looking at human settlements at large; and technology that runs across all these

in terms of dealing with built environment as well as human settlements. Management, again, is important because human settlements need to be managed efficiently.

Within the Planning discipline, there are five specializations being pursued – land use, housing, transport, infrastructure and environment. The pedagogy that is followed is essentially based on lab and studios. That provides a forum for bringing together all these disciplines to apply on a particular project. Like the studios in Planning – they proceed from a part of the city or a ward and cover the entire city. It then breaks into individual disciplines to look at planning as well as projected investment formulation. But at each of those scales the focus is in terms of looking at a special unit from all disciplines and from all angles, which include sustainability issues as well.

Though the CEPT University is divided into five faculties, the focus, as I said, has been on lab and studios, and also on electives. So the courses that the students can choose is not limited and bound by the faculties in which they are located, but they have a choice of electives from across the faculties. And that is a way by which integration and multi-disciplinary education is being fostered. The emphasis is on encouraging the faculty to offer electives and also to students to opt for more electives than narrowly defined mandatory courses.
Sustainability, as of now, I must confess, in the CEPT University is a result of the lineage and genesis of the concept, which is rooted in gas emissions and climate change, which has been a part of the Environmental Science and Engineering departments. But sustainability is more, as I see it, like a value – like inclusive growth. It needs to permeate across disciplines, and how that can be done is a challenge.

To illustrate how various programmes are being conducted in the different disciplines within CEPT, in the Architecture faculty, for example, there are programmes that deal with discourses on sustainability and built environment, resource conservation systems, natural sciences, bringing ecology back to environmental planning, and climate responsive design. Now, one would wonder how these subjects are being dealt with in the Architectural faculty, but that is the significant departure from the common manner in which these disciplines are pursued in universities. This allows for cross- fertilization in programmes chosen by students from different disciplines.

Within the Design faculty, there is a programme on building energy efficiency. In Planning, of course, there are quite a few programmes which deal with environmental issues including sustainability, development and envi- ronment, environment and social impact, environmental law and policy, and environmental modelling, which is more technology oriented. And in the Technological discipline, we have environmental studies, building energy and environment, renewable energy, etc.

Now, what are the challenges? One is that despite the opportunities for education for the students, which goes across disciplines and allows exposure to these things, the question is how sustainability permeates across as a value and how that could be brought about. I don't have solutions –

I have only the question.

I will end with an anecdote which has been stated in many forms. A young doctor starts a hospital and invites his grandfather for its inauguration. The grandfather says, "I won't say that your business should prosper. I don't want your business to prosper because society should be healthy!" Similarly, I think, whether or not sustainability and environment remains as an individual discipline where people narrowly focus on those issues, other people look at it more like a hurdle and find ways to jump over that. That has been the story of environment in India – those who are not involved in environmental issues feel that environmentalists are creating hurdles and try to find ways of jumping over them. How we overcome these problems and address the concept is the challenge.

P S Narayan
Thank you, Prof. Phatak. **Half the world's population lives in cities today, and that proportion is going to go up even further – 75 per cent in the next 40-50 years. Therefore, how we envision and manage urban systems and habitats is very important, and pioneers like CEPT University can play a critical role in that.**

P S Narayan
Professor Raghuram has been faculty at IIM Ahmedabad since 1985. Some of the past positions held include Dean (Faculty), Vice Chancellor of the Indian Maritime University, and Chair Professor, Indian Railways. Prof. Ra- ghuram specializes in infrastructure and transport systems, logistics and supply chain management. His areas of research interest include railways, sport, shipping, aviation and road sectors.
He has published over 35 refereed papers and written over 157 case studies. His teaching experience has been across institutes and universities in India, the United States, Canada, Yugoslavia, Singapore, Tanzania and the UAE. We look forward to hearing your views, Prof. Raghuram.

G Raghuram
I am not too much of an expert on sustainability and the environment except that having been in the institute for a long time, I have, as an observer, seen our own internal debates – the way we have tried to deal with these kinds of issues.

Right in the beginning, there were the value systems. But in the late 70s, there was a slew of recruitments. In the mid-80s, I joined the Public Systems group even though I come from an OR discipline. But I moved in my own personal interest and also because I wanted to work on problems in the transportation sector – largely public transport.

These are two major structural initiatives within the institute that, I would say, address the larger concerns. In terms of programmes, we have five areas. Four are long duration programmes. Then we have an Executive Education programme covering the whole range focused on specific segments – people from defence, who work on resettlement, move into other domains and so on.

The first of the long duration ones we started – and for which the institute was set up – was the two-year postgraduate programme. We followed it up with, almost in parallel, the agri and doctoral programmes. Both got

90s launched a one-year postgraduate programme for executives – people with experience. These are the degree granting long duration programmes. started in the early 70s. Then we waited for quite some time and in the 90s launched a one-year postgraduate programme for executives – people with experience. These are the degree granting long duration programmes.

Then, as I mentioned, there is a whole slew of courses under Executive Education. They could either be an open programme that the institute offers, or those which companies request and are customized for them. Today, we offer close to 150 programmes, with durations anywhere from three days to four months.

Our core courses largely followed what I think was a Western model of management education – basic disciplines like Quantitative Methods, Economics and Organizational Behaviour, and then functional areas like Pro- duction and Operations or Marketing, Finance, Human Resources, Strat- egy... That comprised the first year, with some skill – Written Analysis and Communication, or Computing Skills and so on. The second year was left open to electives.

Interestingly, apart from in the initial years, for a large part of the non-teaching time the excitement for the faculty actually came more from addressing some of the larger problems which would broadly fall under the sustainability umbrella. In the initial years, yes, a lot of corporate problems were being addressed. But as more and more consulting organizations came in, by the 80s the transition was that non-teaching faculty time largely went into these kinds of issues.

So, many courses – electives – naturally got offered. Some of the courses in the early years would not fly because we have a minimum registration. A course like Energy, Environment or Transport had very few takers as a first offer. But over time, some of these courses stabilized. Today we have a very popular elective on Carbon Finance, for example, or Energy and Environment Management, or Environment and Sustainability.

These came in, apart from a lot of sectoral electives – Transportation, Telecom, Electricity – where there were policy issues and long-term questions, even in health and education. Courses like these have stabilized in the elective domain. Still, if we see the total number of registrations, we are in the more traditional model. If I can be a bit unkind to the students, it is placement driven choices that get made. But there is a certain number that likes to explore. It is fun working with them because they come out of interest.

One of the things that the institute has every so many years is a very healthy system of programme reviews. Two years ago, we did two successive reviews. I would say that our Food and Agri Business Management programme is largely centred on what would pass as the questions of sustainability we are addressing – agriculture, issues of rural development... So that is there even as an overall programme.

The PGP also underwent a review two years ago, of which I was a part. We talked to a whole range of stakeholders, especially external. Apart from that, internally there were some issues about whether the first year and

second year were being paced appropriately – there was heavy pressure in the first year and not so much in the second year.

From the external stakeholders, we got five driving principles of how the programme should be reoriented. The first was actually very interesting and came through very strongly. It said to establish a stronger connect with the Indian environment, with problems in the Indian context.
The second one said to enhance the ability to work in a dynamic multicultural globalized world – with a strong slant that Indian companies may go global and we need people who will be able to do that, as opposed to working in multinationals.

The third one was to provide some cutting edge perspectives in general management, a lot of which again comes in from sustainability principles. We said we may want to provide options for specialization, even in part of the first year, because now the awareness levels of students are higher. So these were the kinds of principles that came in, and the programme reviewed around them. I won't get into addressing all that we did for each of these, but restrict myself to the few that have a little more relevance to what we are discussing.

To acquaint with Indian reality, the one important suggestion that came up was that in the first year, for their summer internship, students must do a three-week field work. That was a very important recommendation. Out of the 200+ case studies – IIMA very strongly follows a case pedagogy – that we use in the first year, only a little under 20 per cent are actually in the Indian context, which is pretty sad. So it gets drilled in the students' minds that we look at things through a Western lens. Maybe the approach should be to, as far as possible, use relevant Indian contexts, except where you want to consciously bring in an international flavour, rather than the default being the other way round. The faculty says, we want to give the best case and if that happens to be a Harvard case for that context, then why not? We must consciously move towards bringing in more Indian case studies.

Apart from the field work, we came up with five new courses to be made a part of the core curriculum. One was called Government Systems and Processes, where about 60 per cent of the course is focused on why a soci- ety should have something called a government, or governments at various levels, and then another 40 per cent talking about governments in India as specific cases. Dealing with government, being influenced by government, influencing government – these are major aspects that any organization in India would have to go through.

Others we recommended as core courses were Understanding the Global Organizational Context, again with the primary focus of Indian companies going global, Environment and Sustainability, Having an Entrepreneurial Mindset and Design Thinking. Many of these were anyway electives. How these get implemented is for the faculty to see. The recommendation on field work, unfortunately, has not gone through and I see within the institute maybe an unwillingness to experiment. We are cosy in our structure and, as I said, our main sustainability of the programme is placement – so why rock the boat?

For field work, the faculty said we must have more structure. How will it be managed? What will be the logistics? What if some students do nothing during those three weeks? Will they learn something? Some of us felt that just putting them there was good enough. After all, they have active minds and there will be some churn. But anyway, that has not yet gone through. It is still a recommendation, and on and off we have debates on when we should take it up.

Out of the five courses, the Design Thinking course has not yet gone through, partly because of the faculty. We have now started an elective to first test it out and then implement it. But the remaining four courses have become part of the curriculum.

Along with these, we had made two other recommendations for non-credit courses. One was Ethics and the other was Socio-cultural Environment of Business, which of course has a very long history. Even as early as the mid-70s, when I was a student here, they had started a course called Indian Social and Political Environment. It was then a core course and again there was a lot of uncertainty about the way it was being delivered. They made it non-credit, then back to credit – it went back and forth. It has now become a credit course, so too Ethics, and part of the core curriculum. Here is the debate: How much do you pander to the market? Because of the market, placement and placement orientation, if these were electives, chances are that not all of them would get much registration. On the other hand, if we believe that this is important and today's manager – who is getting educated to be a manager/leader – should know it, then we make it part of the core.

We have one year's experience in these four courses becoming part of the core package. I was involved in teaching Government Systems and Processes and I think, by and large, students have received it well and are engaging with it. My colleague Prof. Turaga will be here to talk more about Business Environment and Sustainability. I hope field work comes in so that people get into these problems, or there is at least a better understanding of them.

Today many consulting companies – be it McKenzie, KPMG or whatever – are bringing emphasis on these kinds of problems. So if, as I said, a large part of the students are being driven by the world out there or what the best jobs are, their interests will go that way. Maybe large corporates, too, would view these as important issues for their CSR. So if these were part of some electives on CSR or Carbon Finance and so on, or core courses, the acceptance would be higher.

Many student projects would like to explore some of these things. They see a CV value by just showing that they are open to looking at some interesting problem areas. Of course, in the institute, right from the beginning, we have always had a certain number who are willing to step out of the mainstream and explore, work with NGOs and so on. They have done very good, impactful work which addresses significant problems that India as a country faces, or brings the focus on these larger global issues. That number is increasing, and that is a positive thing.

Finally, about challenges as we go forward... I don't know as an Institute, but in terms of our student output, yes, some change and more inclusive thinking on these kinds of issues is happening. Beyond that, I am not sure because, as I said, the first job still drives a lot of the thinking. But non-teaching faculty time is in a significant way oriented towards looking at these kinds of problems.

In a way, I also look at that in the larger Indian context, and I think that is where many challenges are. We are still a very aspirational country. It is easy to talk about public transport. Of course, I am sure that if public transport is improved, we can hold on to people. I would say 'hold on to' because when we compare ourselves with many Western countries, the public transport share in India is significantly higher – the numbers that Western countries today would aspire for, given the climate and environmental concerns. So, for us, the challenge is: can we hold on to those market shares? Of course we need to improve the services. But all said and done, the aspirational element is so strong that people would love to own and use their own vehicles. So do we still need, as a society, to go through that aspirational peak? And then, once people know that okay, I have this, but there are larger concerns which I need to contribute to, and therefore let me minimize my personalized transport and take more public trans- port? I think these are big challenges.

Again, there is an India and there is a Bharat. Very often, these are used as terms to reflect how disparate India is. Take a simple thing like toilets – in terms of Swachh Bharat and so on. I am not sure how many of our students will address the problem. At the faculty level, on and off, we have had opportunities to look at it. There is a big behaviourial issue. You can create toilet infrastructure, but the behavioural issue is bigger. People are not yet convinced that they should use toilets.

Maybe there is a big opportunity for Design Thinking here. I have had the chance to visit and written a case study on a village where they claimed 100 per cent ODF. But in reality, they had ODF only in terms of toilet ownership, not in usage. And why was that? There are a variety of reasons. Like some still think it is more hygienic – personal hygiene-wise – to do it in the open instead of this claustrophobic space that has got created. These are things to worry about. What is it that will bring behavioural change? What is it that they are really looking for?

Even within the institute we are, I would say, 80 percent clean. But why can't we reach 100 percent, where nobody drops even a small thing? Or, when there is an event, why do students not go through that circular thinking of post-event cleaning up immediately? Or, you have all these food stalls, but do you apply your mind to the volume of waste that is going to get generated? Are there enough garbage cans? Is there the capability to remove the garbage? There may be garbage cans but soon they start spilling – and once they do, people lose the need to be hygienic and spill all around. It is worrisome. Poorer people may not even understand what better hygiene is. So these are sustainability issues at the local level, but of course, the global issues are quite significant too.

A final point of challenge... Coming back to the institute, at the recruitment level we have significant challenges because it again reflects our thinking. But even in a place like IIM, where we think interdisciplinary work is important, when we recruit faculty we are still in silos. We say, hey, he's a Marketing person – can he teach core Marketing? What is his background? Of course, once in, if that Marketing person wants to start working in Public Policy or wants interface with Logistics, that is okay. But at the recruitment level, we are still not open to people who are already straddling areas. At least, as Dean (Faculty), I found it extremely difficult to propose candidates who I thought would be useful for the institute. We need a lot more change.

P S Narayan:
There are several interesting takeaways, right from the fact that you chose to call it management rather than business administration, to that you chose to admit Public Systems as part of the institute early in the 1970s. You were very self critical, but there were several heartening things you talked about – core courses that have been introduced, faculty time spent on larger public issues, etc. So I think a premier institute like IIM Ahmedabad, having taken all these steps and continuing to think on these issues is by itself of great value.

P S Narayan:
Professor Aniruddha Pandit, is a UGC Professor at the Institute of Chemical Technology. He has authored over 300 publications, five books, 12 chapters, and he owns 13 patents. Prof. Pandit is on the editorial board of five international scientific journals. He has guided 37 PhDs and 85 Masters students so far. In addition to research, Prof. Pandit has contributed to innovation in teaching at the graduate and undergraduate levels. He is actively involved in working with committees in the areas of Harvesting Solar Energy and with Fibre Populations, extending Chemical Engineering principles for drying of farm/forest produce, and Water Disin- fection for Potable Water.

A B Pandit:
I was listening rapt, to what Professor Raghuram was saying. To the best of my knowledge, this is the problem faced by many outposts of top institutes – to bring about a real change.

I made a note of ten points where sustainability means different things to different people, how sustainability can be incorporated into engineering, and what the difficulties are for us educators to introduce it, as Dr. Raghuram pointed out. What opportunities does a sustainability engineer have after he graduates? Where is he going to find placement?

We start with professional sustainability. How do we sustain our profession itself? Two things are important. One, you have to create new knowledge so that the profession doesn't get boring – otherwise it will be replaced by software or machines. And then arises the question of employment. So, professional sustainability involves innovation to keep it interesting. The second part involves upgradation of knowledge, so you are able to integrate learning from various things into your profession and are not working in a silo, as Prof. Raghuram correctly pointed out, but interacting with others.

In my opinion, every engineering course should have one course that is equivalent to the chemical engineering course of Material-Energy Balance, or what you can call Global Resource Balance. To bring about any change, to make any product, what are the resources you are using? They could be material, energy, manpower... Even manpower needs to be alive, to be fed, and for that you use energy. So a complete cradle-to-grave approach, or a life-cycle analysis, needs to be carried out to be able to decide how the process of sustainability can be integrated into products, beginning with a balance of resource utilization.

Then we need to integrate the principles of Green Chemistry. **There are 12 principles. I am not going to elaborate on them but, essentially, when we say we want to be sustainable, does it mean for a thousand years? For 10,000 years? Or are we talking about sustainability in our lifetime, or in our children's lifetime or our grandchildren's lifetime? What is that time- span over which you are aiming at assessing or expecting sustainability?**

Of course, the concepts will keep on changing. You can derive a lot by learning from nature – bio-mimicry or circular economy. Nature does tell us many things. It has sustained itself over millennia. Some changes take place. In our case also, changes need to take place to make life interesting, not boring. If things had been exactly the same, we would not have migrated from our villages to cities. All of this, including the economy, is what we call sustainability engineering – again, starting with basic balance of resources.

There are certain lifestyle defined problems. These occur because people do not necessarily think in terms of resource utilization or in terms of their interaction with nature. Then we try to find out solutions to these. As Dr Raghuram said, that it is looked upon as jumping over a hurdle rather than trying to find out how this hurdle does not come about. So we have to look into integrated process design and circular economy or bio-mimicry. All this is taught at the Institute of Chemical Technology, initially as Environmental Engineering and Pollution Control, then as Environmental Engineering and Process Safety, and now as Sustainable Engineering and Process Safety.

About 20-30 years ago, only petrochemical industries or industries dealing with flammable materials used to have a safety engineer. So anyone who graduated as a safety engineer probably only had one option, one job opportunity. How many companies now have sustainability groups and engineers? So if we teach students, what jobs will be available to them? Would UGC (University Grants Commission) and AICTE (All India Council for Technical Education) and the Department of Technical Education recognize such a course? If it is not recognized, what opportunity are the graduates going to have? One needs to think in terms of sustainability in our education system itself.

The system that is taught is known as Exergy Analysis. Like energy balance, there is exergy balance. Exergy, essentially, is how much we are away from equilibrium, which is our environment. Whenever we try to carry out something, we are moving away from the environment and returning to it. That sometimes happens irreversibly. Or, even if it happens reversibly,

there is a permanent loss of exergy, and that means a permanent increase in entropy. All this can be integrated and quantified, quantitative management. All processes and activities can be done with an exergy balance to see and judge sustainability.

So there are multiple issues and problems. But what is essentially needed is to introduce and integrate the issue of sustainability in the curriculum not necessarily under that name, but the issues involved. We have to create the awareness that the nearer to the environment or nature you are, and if you mimic how nature has been able to sustain itself and survive for such a long period, you can improve your own sustainability.

Over a period, we have brought in many innovations, but basic resource balance, optimization of resources, circular economy and bio-mimicry – these are the subjects which every engineering professional needs to know.

P S Narayan:
Thank you, Professor Pandit, for your comprehensive summary and overview of changes and interventions that are required in technology and engineering curricula. It is common understanding that a lot of problems, and a lot of solutions as well, are embedded in technology. And therefore, what the technology sector can do or cannot do will make a crucial difference.

Ps Narayan: Professor Shashank Mehta is a qualified Mechanical Engineer and Product Designer. Prof. Mehta has worked in small and large scale industries as well as in the craft and social sectors. Over the years, he has taught various courses at the undergraduate and postgraduate levels and has spearheaded the introduction of new course modules such as Indigenous Innovations, Service Design, Design Audit and Introduction to Experience Design to keep up with the rapidly changing demands and aspirations of industry and economy. He has been instrumental in developing the curriculum for the four-year undergraduate program in Product Design and the postgraduate program in Product Design Engineering.

He has worked extensively in the area of Technology and Design Fusion, Sustainability and Indigenous Innovation. He has authored various articles and research papers and has anchored international workshops focused on design for development.

Shashank Mehta:
This topic of integrating sustainability in design education has been both- ering us at NID (National Institute for Design) for many years, with our in- ternational partners as well. We offer about 20 postgraduate programmes and nine undergraduate programmes. And all the time, the question that keeps coming up is: **Why is it that there is no postgraduate or undergradu- ate programme such as Design for Sustainability or Sustainable Design? And we always find – as Prof. Phatak mentioned – that it is something which is ingrained as part of learning.**

I believe, from experience, that future society is based on three pillars: environment, ethics and empathy. Ethics and empathy, if you see, are there in all discussions – in fact, even in a lot of the discussions with our international partners. The two important parameters that are missing in

I was working at the coastal belt on developing, for fisherwomen, some kind of a load-carrying device. There are more than about 50,000 women working there and, after the age of 40-45, all of them had a backache problem from carrying loads of 35-40 kilos.

Earlier, I was working with the company, Anjali. They make hand held mixer-grinders, and produce almost about 1,000 per day. They asked me to design the blade for the mixer, because that's the core requirement. It was very difficult for me to design just a simple blade because the design had to be based on the premise that one could use only the size of scrap mate- rial that they were generating from another industry.

Would the next generation be interested to work in these areas? And what is the value addition they can create? The interesting thing is that the large middle-income group segment is always very conscious, looking at all aspects – usability, maintenance, everything.

Sometimes the students ask me, "How would the design brief be different if it was given to a student in, maybe, Europe?" I say that the design brief would be the same, but when you start working on the project the process would be different. In sustainability, the main part is the process.

Looking at the overall scenario in this context, I had once written that sustainability is all about creating employment opportunities, and utilizing existing skills and resources that are available. What I also believe in is what Prof. Mashelkar coined as 'Gandhian engineering' – the best quality at the lowest or most affordable price, which is the challenge India and the world face today.

Similarly, if you think of what Gandhi said about things being produced by masses rather than mass produced, the challenge for designers is that design does not remain only with them. You find some of the best examples outside urban India. For example, I come from the village of Lijjat papad, and I have seen over the years what economic independence it has provid- ed the women, just because they can roll out papads. The same with Amul. It has connected materials and resources to the market, and created a platform. Otherwise, those people would have had to migrate to the city.

NID was set up by Charles and Ray Eames, if you have heard of them. They were furniture designers who developed The India Report which said that this should be an institute that produced designers who would create a product like the earthen pot. They went around the entire country and found that while the design, shape, size and form of the pot were different from Rajasthan to Tamil Nadu to Gujarat and elsewhere, there was not even one area where it wasn't used. All had optimum design – for a spe- cific context, for a specific requirement and for a specific material.

So in the Indian context, design and sustainability are more towards improving the quality of life of the people. That becomes the basis rather than any other aspect. I have had many discussions about material saving, but all that is secondary. This is what for me broadly constitutes good design.

NID's education programme starts with simple courses like Environment Perception, where we take students to a village. They document, understand and live in there for 15-20 days. We believe that this kind of field study is the base for design – the entire education is project based. The students connect with reality. Design is all about humility, sensitivity and empathy. That is most important. The moment that comes, the rest fol- lows.

To develop this, the approach is 'learning to learn'. It is just not about providing information. You go out and learn, by doing things and learning together. For that, we develop courses like Environment Perception where students have to go out and document types of behaviour.

While we learn from the environment outside, from people and society, we also have craft documentation where the student lives with a craftsperson. The interesting part is that on the first day, the student will be sitting on a chair and the craftsman working on the floor. After five days, you find the student sitting next to the craftsperson and working with him or her. They start developing respect and humility.

Society has enough resources to sensitize people to understand. Indian culture has sustainability that is ingrained, which is what we have to learn from. And that is why NID's points of focus are learning by doing things, project based education, and to keep things as connected to reality as possible.

What is the most important for India and the challenge for designers is that we have to become catalysts for change. We don't just stop at designing a product. We need to do a backward analysis to see from where the material is coming, how we have to train people, if a policy change is required, and also look at the forward carriage in the sense of how the product is going to be marketed. All that has to be linked.

Overall, humility, sensitivity and ethics that come with empathy are the critical parts of sustainability. And the best way to ingrain and impart this is project based education, real life education. India, as a society, has so much to offer outside.

P S Narayan:
Thank you for the wonderful insights into the kind of thinking that permeates NID's vision and philosophy – the fact that empathy, ethics and humility have to be at the centre of design, whether it is for a product or a process. It is a great insight.

We have had really a rich blending of insights from the fields of management, technology, architectural planning and design. Challenges have been tabled. It is interesting as well as difficult in many ways that India is an aspirational society. Yet, how do we have humility and empathy at the heart of everything we do? Technology has an important role to play. But how do you bring in design thinking? There are lots of factors that need to come into it, some of which resonate and reinforce each other and some of which may not.


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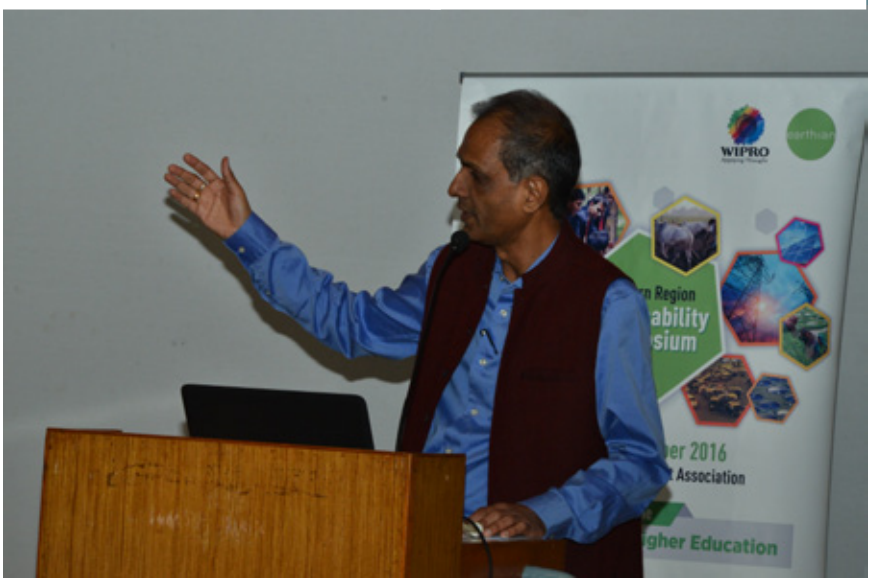
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SESSION 02

MASTER CLASS

Abhijit Zacharia:
Our master-classes will be an encapsulation of CEPT, NID and CTARA's pedagogies, methodologies, and the tools they use to disseminate this kind of information in classroom, to give a nuanced understanding of how these processes are followed in each of their institutes. This special session will combine theoretical and practical knowledge and provide participants with first-hand insights. They will help develop cognitive and practical frameworks for design practices, urban planning techniques, application based learning etc - that are trans-disciplinary and implementable in the curricular context

MASTER CLASS 1:

Sustainability and Habitat Education

Institute:
CEPT (Centre for Environmental Planning and Technology University)

FACILITATORS:

Mona Iyer
Associate Professor/Professor of Faculty and Planning

Jai Thakkar
Associate Professor, Faculty of Design

Urvi Desai
Associate Professor, Faculty of Architecture

Mona Iyer:
We do not have a separate course titled Sustainability, but it is embedded across. As planners, how do we look at cities and regions and sustainability? This is what I would like to talk about.
We started the School of Planning in 1972 with a programme called Urban and Regional Planning. At that time it was largely spatial planning – about space, and the growth trajectory of cities. Around 1982, we introduced Housing, a specialization wherein students would learn basics of Urban and Regional Planning but specialize in housing – affordable housing, or the supply of housing in cities. In the mid 80s, we came up with Environmental Planning.
Here I am trying to draw parallels with what Prof. Pandit also said, that we need to create new as well as update old knowledge. CEPT has been doing this over a period of time, adding not just programmes within departments, but also more departments. Environmental Planning was added in the late 80s as a separate vertical within Planning. So students would specialize in the environmental aspects of spatial development – laws, leg- islations,

India was gearing up to provide more infrastructure in cities, and we thought it was time to intervene as planners and see where we stand as educators in this regard, because that is something our students would be required to do when they go out into the field. The last specialization, which we introduced in 2009, was Urban Transport because urban transport and public transport systems had come into the forefront in a big way in the metropolitan cities. So a student gets a Masters degree in Urban and Regional Planning but specializes in any of these verticals.

We continue to reflect on the courses we have. Not all have course titles – some are domain titles: Urban and Regional Economics; Financing of Urban Development, through private, public and public-private partnerships; Negotiation and Consensus Building, because planning is largely a negotiation process for each and every decision in the public realm; Planning Legislations, which support these decisions; History of Urban Transforma- tions; and Theory of Physical Planning. People, Society and Culture is a multi-disciplinary course where we get graduates from engineering, architecture, social sciences, economics and planning, and they are exposed to other disciplines. Then, Environment and Development is one thematic area. The others are Housing, Infrastructure and Transport, within which we have multiple courses that help students specialize in those fields.

This has been our take so far on Urban Planning, and it keeps evolving. A system of Board of Studies that was active for many years is being revived, where a group of experts recruits experts from academics outside CEPT, and also professionals, to deliberate on relevant course content. We are trying to see if this can be done in a more comprehensive manner, rather than department-wise.

Largely, pedagogy revolves around the studios. Lectures, tutorials and field visits feed into the studios. There are elective courses – curricular or co- curricular – for students to try out additional knowledge. It could be things like sketching, theatre or clay modelling, and comprise 25 per cent of the credits. The remaining 75 per cent is mandatory. This was a change that came about in the last three-four years because we felt that students needed the flexibility to study and be sensitized to other disciplines.

Summer-winter is a new concept we have been toying with in the last four years. For students who want to explore planning, architecture and design issues outside or within Gujarat, or outside India, there are travel-based summer-winter courses. Some are also campus-based, where students are given three weeks out of their academic calendar to go out and do courses with outside experts who may not be able to give time throughout the semester in a structured fashion, as hours per week, but in a modular format for, say, ten days. These really help students explore the world through different lenses.

In every semester almost half the academic credits are given to the studio. So in a 20-credit semester, nine credits are for the studio. That is the kind of weightage. All the courses are structured and designed in a way that they feed into the interventions students need to make in the studio.

In the first semester studio a multidisciplinary group sits together to start understanding the urban area. There are lots of fights and strong positions taken because of the way they have been trained to think. The maximum unlearning and relearning happens in this semester. They learn how to negotiate and be flexible when needed – essential for planners, because they will always have to operate in a multidisciplinary domain.

In this foundation semester they grapple with the idea of urban. Students are divided into groups of ten, each group mentored by a faculty member, and sent into the field. We base this studio in Ahmedabad because this is their first interaction with the urban domain. They observe the wards of the city from different perspectives, and do mapping exercises of the infrastructure in terms of roads, signals, junctions, street design, waste water, storm water... Basically, to understand how a ward in a city functions, the facilities available, and what kind of informality exists within the formal set-up. They learn about appropriated urban spaces, and how to improve mobility, infrastructure and standard of living. They try to under- stand how a ward works in terms of governance in an urban setting. Who takes decisions at this level? Who decides on funds?

Each group then comes up with its own vision for interventions – it could be to enhance green spaces; regulate the traffic for transport-oriented development, improved physical infrastructure for pedestrian connectivity and non-motorized transport; solid waste management problems, and so on. They bring in the theoretical understanding from their courses that semester – like micro economics which teaches them how a local economy functions, quantitative techniques of evaluating urban spaces, and the his- tory of urban transformation. Lecturing happens within the studio as well – context specific things that cannot be captured in a classroom session, such as issues in a particular ward where a group is working. It is discussed with the others, there is mentoring, and a ward plan evolved to make living conditions better.

In the second semester, they go on to an urban development plan where they try and understand what an urban sprawl is. Things like: In which direction is the city growing? In which direction should it be made to grow? What is the connectivity, public transport availability? Is there a need for infrastructure improvement? What is the kind of industrial, residential or mixed zoning? What are the employment opportunities? Macro economics starts feeding in a little more, so too housing issues in the city – essentially about affordable housing and spatial equity for the poor. So they come up with an urban development plan.

After working together for a month on a city, they branch out into the five specializations I mentioned. One group looks at the city only from the transport perspective. Those who want to specialize in environment take that position – they would probably have a plan with more no-go zones for development, and steps to reduce private and increase public transport because of the kind of GHE potential from the traffic. Infrastructure students would mainly look at the demand-supply of infrastructure, how the gap can be bridged with available funds, the investment plan required for future expansion... those kinds of things.

This is what they go through in the studios in the Faculty of Planning, for

the 75 per cent mandatory credits. For the remaining 25 per cent, they do things like water sports, theatre, gardening and yoga, which helps them become well-rounded individuals. Urvi will talk about Architecture and Jai about Design. And then we can take the discussion together because the pedagogy is common across disciplines.

Urvi Desai:
If we take the concept of sustainable to mean the framework as decided by the UN, then at Architecture we believe that the implementation will require going from the four 'e's to the four 'i's – acknowledging that interdependence is the key and interdisciplinary education is the need, and therefore, integrating, innovating and (informal) institutionalization. 'Informal' is in brackets because both formal and informal have important roles to play. We try and do this through all our courses.

We have both focused and integrated learning. There are other courses too, and we also have specifics. Within the Bachelor of Architecture programme is an area called Environment, and four courses are offered as part of that through the five years. Students start with an introduction to the environment, build it up with Climate Responsive Design, go to Day Lighting and end with Sustainable Design. Each course builds on the under- standing of the previous one. We are increasingly making them interactive and participative, not lecture based. The idea is to apply the concepts in design, so although theoretical in nature they include workshop or in-class exercises. Sustainability is brought in as integrated learning into almost all courses, even in Structures or History.

Since the last one or two years, we have started having the Advocacy thesis. Increasingly for architects, as they step outside their field, especially for sustainability concerns, activism is one possible domain – an area where they can engage in to bring about larger social sustainability and change. Interested students tie up with an NGO to pick up an issue and advocate on behalf of marginalized communities or people.

The studio, as Mona mentioned, is the nucleus of our educational method. The format works wonderfully, irrespective of the subject. It is the place where students collate all their learning and information and apply it, and it seems to be the best format for sustainability education. All the work is documented in the Year Book of the Faculty of Architecture, which is published at the end of every academic year and carries the work of the students. Often in discourses on sustainability, while we may have con- cepts of theoretical constructs, we don't have empirical data in the Indian context. Our studios, courses and theses generate a database that allows us to talk about our understanding of sustainability with far more confidence and use it in our context.

I will give you an example, through a video clip, of one studio that I did last year with the second and third year Bachelor of Architecture students – young 19-20-year-olds – aimed at participatory design process in order to create socially and environmentally responsible architecture. We decided to, as an experiment, practically shift outside CEPT to make the site the actual studio – a low-income neighbourhood in the Odhav area in Ahmedabad. It is an industrial area with a population consisting of Gujaratis and migrants from Bihar. The students were not expected to

develop their perceptions as outsiders but to go [illegible] neighbourhood and understand, from the perspective of the residents, how they viewed their built environment.

The students learnt how to do field survey techniques, focus-group discussions and questionnaires, and were alerted about being careful about their own biases and so on. We did a small pilot study at CEPT, trying to understand the perception of CEPT students about their campus. Then, with these learnings, the students were able to design their perception study of the Odhav site.

We told the students that the very first thing was to feel the place with all the five senses. There was nothing to note/draw/map/observe/write. They came back and drew some collages of their impressions. We went back and made basic observations on issues like lack of urban spaces, garbage disposal and sanitation problems, safety of women and children, lack of lighting and ventilation in the houses, etc. The whole site was extensively mapped through different media, and it showed that there were mainly single-storeyed housing units with kutcha roofs. Next we interacted with different people, asking them about their livelihood, making small talk, and asking questions about their neighbours' occupations. We mapped their modes of earning and tried identifying the most common occupations.

Two areas had to be studied further – Bhavani Nagar, a cohesive community, and Rabadi Vasahat, a socially diverse community. We divided ourselves into two groups and set about observing people – where and when they cook, wash clothes, bathe, play, etc. – and did activity mapping based on different timings. This gave us a deeper insight into the lives of these people.

We then prepared a questionnaire and started conducting focus-group discussions with men, women and kids of the community. We asked ques- tions regarding their occupations, problem spaces, safety, lack of amenities, and so on. Having finished the site model, we conducted consultative workshops in our respective areas. We took our site models, sheets and presentations to show the community what we had learnt about them. They were fascinated by the model and tried finding their own houses. We realized that it helped them understand our work better.

Based on their response, we formulated our design proposal. Each site proposed a community centre and housing. The housing projects focused on enhancing living conditions by providing more comfortable spaces to live in, along with better socially interactive spaces. The community centre fo- cused on providing good spaces for women to work, children to play, adults to learn, and spaces which would enhance social interaction.

From this point on, we developed our design proposals, and continued that process by conducting multiple design shivirs. It helped us know their specific needs better. We made models which were easy for them to understand, and made them design spaces they would like to use. We also did a short exercise where we selected a spot on the main road that was filled with garbage, with the idea of making interventions to enhance social life and to reduce garbage disposal in that area. This extensive process truly enriched our way of designing for the people, and gave us a glimpse

Jay Thakkar:
As a profession, interior design has no rules or regulations, and requires no licensing to practise it. There are courses from six months to three years throughout India and anybody can be in it. Hence our position on what we are becomes important.

Sustainability is a term that has been emerging lately, and I looked at it in terms of the core of interior design education – ecology, economics, culture and politics – and the philosophy with which the domain was established in CEPT University. Interior design is a very luxury-oriented profession, when you look at malls, hotels and airports, or sample apartments in the newspaper. That is the market. So, as the earlier speakers said, how much would you compromise your core philosophy visà-vis the market? How do you negotiate both of them?

We realized that we needed to expose students to multiple facets and let them choose their paths, but within some tenets planted in their minds. The education system should be like that, something that changes your perception over a period of time. We took history and heritage as core tenets – the culture and society in which we live, also craft and technology, so that we move closer to those ideas of making things, and then look at material and technology that will help us do that.

In India, there are very few schools for interior design that look at five years of education. Most are from one to three years. Students and parents ask, why do you need five years? It is because of the research, a core focus area, which binds everything together from the first to the final year and the postgraduate courses.

Design research means actually making something. You experiment with it, not knowing what will come out of it. In our education system we are used to a defined set of answers. Not knowing what is going to happen at the end is an anomaly.

Applied research is where you actually use technological tools in order to know what the system is going to be. You have your research, you put it in application, and you have a formation. We have a centre which is already looking at energy efficiency. It evolved from the Faculty of Design, largely to look at how energy within a building, within an interior, would play a larger role.

The third is field research. In India, we have a huge amount of traditional knowledge that connects design and the environment. This knowledge lies out in the open, and hence the idea of going out on field work.

The term 'Gandhian engineering' came up. I thought it was interesting – Gandhi and engineering, Gandhi and design... Why not? I went on to think about what he also said about not giving advice but being an example – updesh na do, udaaharan bano. It seems to be a kind of prime principle. We go out into the field and collect knowledge and information from people, from society, and make a great set of reports and documentation. We started realizing that we were only taking, that we need to give back to society. All these centres at CEPT act as nodal bodies between the institution, society and academicians – they are the points for us to give back to society.

One of them is the Design Innovation and Craft Resource Centre, which looks at craft and its sensibilities. General data shows we have more than one crore craftspeople in India. It is the second largest employment profession in India, with a huge set of resources and traditional knowledge.

On-site learning is a core approach – sometimes from a very precarious environment, like snow and minus-2 degrees in Himachal – which exposes students to multiple experiences. It is not about information. These days, with Google, you want to know anything and it's there. This is about expe- rientia l learning, tacit knowledge imbibed by students that they won't get from classroom study.

Studios are largely discussion based learning platforms, with the professor and students in a flat hierarchy. Everyone learns from each other and so there is a sense of vulnerability – no one knows everything, unlike the earlier pedagogy where the professor knew all. Now if I say something to my students, they are googling to see whether I am right or not! Actually, now when they do a presentation, I too am Googling to check and say, "Sorry, boss, this is Wikipedia information. I need a different set of information from somewhere else – your own set." That is how we evolve.

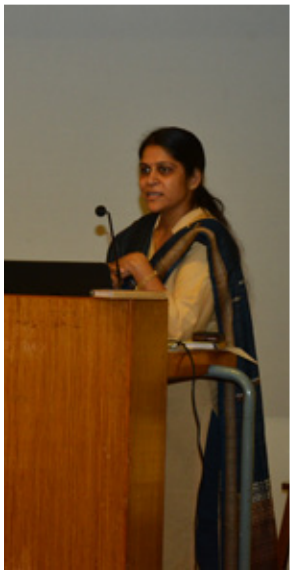
Here too, we are learning from the masters (in the audience) though this is a master class! The question is, who really has the knowledge? Whom do we count as people we want to learn from? For us, when we say traditional knowledge, we realise there is a huge number of people outside, master craftspeople, who have critical sets of knowledge that need to come out in multiple environments. So we go out for it, and also bring it into our studio. We are trying to open up barriers to say, "If you have knowledge, let's share it." That is the pedagogy that we are operating with.

Interior design seems luxury oriented, but one of our studios was on the adaptive reuse of a fort in Goa. In terms of planning, it was restored. But there was no inherent aspect of sustainability, so we had to input new pro- grammes to make it self-sustainable. The students looked at Goa, at the culture, and said they could be musical soirées there, or a museum for mu- sic. They looked at the heritage and said, let's revive it. Within Ahmedabad too, B&Bs within the heritage areas are becoming models for adaptive reuse – including as a relief camp for flood victims.

In our materials studio there is a little plaque that shows the making of a boat. How does interior design connect with making boats? It is about understanding the principles of making and materials, and then experimenting with it. The students made the boat themselves out of bamboo, the fastest growing natural material. They got the bamboo and learnt how to construct a boat from the local people – how else would they know how to go about it? It was difficult but they made it, wondering if it would float. Then they actually went to the lake with it – and it floated! That's a knowledge which will stay with them forever, a critically important turning point. So within interior design, once they understand material, technology and principles, it becomes the core of whatever project they do. They even tried using local and natural materials, instead of plastic, for something like a wheelbarrow for carrying things.

We look at multiple sets of craft forms, because we also love aesthetics. So the ideas of sustainability, aspirations and lifestyle all have to come together. Otherwise we will think that we are only solving problems. Some of the summer-winter schools we did were about looking at identity embedded in the culture. How can we take it further? In one, we looked at nature. There was mention of bio-mimicry – a student of interior design actually published a book on bio-mimicry. He now takes some of the summer-winter sessions, looking at how bio-mimicry, the adaptive system and technology can work together – combining nature and technology, learning from them.

We are trying to experiment at multiple levels and not looking at interior design as something only within an envelope – not just how people use a space but how to change the perception of the people.




22nd October 2016
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Theme
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Q&A

Prakash Rao:
Mona, you gave the example of having the studio through the first three semesters and project in the final semester. As students learn gradually and get to the point of the project, do they also go and meet relevant in- dividuals and agencies for more inputs? Because they are looking at very specific aspects – whether water or water management, sanitation or common delivery services. Would they see how these agencies work and factor in those points as well?

Mona Iyer:
It depends on the situation. In that particular semester, what was the location of the student? When we did it for Ahmedabad, it was possible to go back and sound out ideas with the stakeholders. When we did it for Kalol we presented the studio output to the council – elected members, as well as the ULB (Urban Local Body) officers – to get things rolling, showing what would work, what wouldn't, what people wanted or didn't want... But the councillors were only looking at quick fixes – some streets upgraded, that kind of thing.

So if it is a part of the city and there is ULB support, we do a presentation to them, as in Bhuj where we are doing a studio this semester. Once the studio concludes we will present it to the invited guests of the ULB, who could be elected representatives, ULB officers or NGOs. The students would then get the experience about how their work is received.

When it is within Ahmedabad or around, then they go and discuss it with the agencies one-to-one, and we invite those practitioners for the jury. Of late, we have started inviting them for mid-term juries, so that their inputs can be more helpful. If it's for final review, we can't do much about it. In the last two years, we have got them for mid-term and then tried to get the same person for the final to see what improvements students have made. Earlier, we used to get them only for the final review.

Prakash Rao:
Have any of these examples actually got translated to action, got implemented?

Mona Iyer:
The one in Ahmedabad. At that time, they were toying with waste water reuse themselves and had put up a pilot plant in the municipal nursery, which provides saplings to their own parks and gardens. Based on that, our students said they could replicate it at Law Garden and Parimal Garden, very prominent and well kept gardens with private sector participation. The corporation also had a proposal in the pipeline, which they could push through the general council because of the students' work that simulated what savings would accrue if they didn't use groundwater for watering plants. So if the timing is right, then we get to see such things. It doesn't happen every time.

It might happen now in Bhuj. There are already waste water recharge pilots by one of the NGOs and our students are identifying more appropriate locations for those pilots, with a technical evaluation waste location idea. So there is a client ready to see the work and receive inputs. We also try to select cities where we want better reception.

Pravat Kar:
In a particular semester, you said that out of 20 credits probably nine credits would go to a studio. Does it mean that nine credits become one course or multiple courses?

Mona Iyer:
One course.

Pravat Kar:
The correlated question is, how do you measure the student's performance? Apart from mid-term and end-term, are there other reviews?

Mona Iyer:
That flexibility is given to the studio coordinator who decides if there should be any other reviews. They could say, now field work is over and this is the first titration, you present your data. They may want to invite other faculty members who are not part of the studio but who are teaching Statistics or something else. Coordinators often do that. Sometimes, the proposals have to be vetted by experts. Like for rainwater harvesting, I may not know how exactly it works on the ground and get experts from the field who say how a tankha is made and maintained. Then, in a way, it becomes a review of that group working on rainwater harvesting, on how much they inculcate from this interaction with the experts. The faculty works very closely with the students. Generally, it is one faculty per ten students, with almost a one-to-one interaction.

Pravat Kar:
So each of these ten students and one faculty are a part of the coordination group, then?

Mona Iyer:
Yes. If there are a hundred students in a studio, it is split into groups of ten, and each is given one faculty.

Pravat Kar:
Would all the ten faculty members have a say in the planning of the studio?

Mona Iyer:
They would have a say in the design of the studio, and they would collectively decide which ten locations the students will go to to within Ahmedabad. They would have a common agreement on what kind of out puts we want to have. But they won't interfere in each other's group.

It also becomes very faculty driven. If I am taking the studio and my focus is more on water sanitation, my studio will veer that way. If somebody has a transport specialization as a faculty or as an instructor, they may tend to guide students more towards transport oriented projects. But they

learn from each other when they work collectively.

Also, the mid-term review is by other faculty members, and they may point out that one value has been missed out or an aspect has been overworked. We start it in the first semester, and the second semester onwards, they choose their specialization and work with a focus.

Aniruddha Pandit:
I will make one small comment. You are classically following the principle of: I read, I remember; I see, I understand; I do, I know. What you are suggesting is that a student-to-teacher ratio of about 10:1 is acceptable.

Mona Iyer:
That is what we have arrived at, for the moment.

Aniruddha Pandit:
From the teaching point of view, for getting the best out of the students, I think this ratio which you have arrived at is fine. According to you, out of the total, let's say, eight or ten hours of time spent in the department, when you want to follow the projects of ten students and so on, what quantum of time is available for you to follow your own research interests? Or are you doing it through the students themselves?

Mona Iyer:
It is both ways, actually. A lot of learning and our research interests get furthered when we work with them in the studios. It definitely helps us. As far as our workload goes, if I take a studio in one semester, I have to put in a minimum of nine hours a week, which is one-to-one interaction. The outside-classroom interactions are separate. Some faculty members would be more loaded than others, depending on their own specialization or expertise.

So there are all those disparities. But on an average, a faculty member is expected to teach one studio in one year – the other semester is free. And you are supposed to take three taught courses in a year, on an average. So, in a way, one can keep one semester light and another heavy. The studio semester is definitely heavy for the faculty member. But in it, generally, people try and further their own concepts. They try them out in the studio and see whether they work or don't work.

As Jay said, we don't presume. We don't even like to convey that we know everything. If we don't know, we are just candid about it, we explore it together. Then our role is more like mentoring them and exploring it in a systematic way, with the students.

Aniruddha Pandit:
Where do the students as well as the faculty have the opportunities to present and publish the results of these particular projects or reports that come out?

Jay Thakkar:
It happens at multiple levels. First, we have a Research Publication Cell in which the research of some of the faculty members gets published. Students' theses of a certain standard are also published as books.

We are the only university that has this within the Design and Architecture departments, and have the maximum publications in print. Second, we have something called the CEPT Portfolio through which the accumulated work of faculty as well as students is put out in the public domain.

Third, all the centres do their own independent sets of research which gets published. In our centre we have an open sharing policy. With all the data collected, we have compiled a huge set of directories of craftspeople throughout India, a catalogue, and extensive documentation of traditional houses. Post-British, nobody has done such extensive work. Everything is online for people to know and share.

Aniruddha Pandit:
Anybody can access this?

Jay Thakar:
Anybody.

Urvi Desai:
I also want to add that, through students' initiatives and faculty support, the work a student does as part of a thesis or even term pa- pers for theoretical courses are taken forward for presentation at conferences or publication in journals. They might be co-authored with a faculty member. Students do a lot of independent research and work, too, and we encourage them to publish on their own or present in conferences. To add to the answer about time for research, we have also started developing a system where faculty members always have teaching assistants for their courses. So in the studio, for the 1:10 ratio the faculty member will have a teaching assistant, if required.

Aniruddha Pandit:
A postgraduate student, usually, or...?

Urvi Desai:
The teaching assistant is usually a senior-level undergraduate student or could also be a postgraduate student. Or we may have an academic associate who is a graduate, and also research assistants. So faculty mem- bers who have undertaken some research and need some support with that can request for research assistants, and CEPT University will provide them. That allows a little more time and flexibility for research on their own.

Mona Iyer:
We also have archives now.

Jay Thakkar:
Yes, CEPT has one of the biggest archives related to Planning, Design and Architecture – not only data but looking at the profession as a whole, trying to put everything together.

Mona Iyer:
There is a separate building recently developed as an archive. We felt that over the years we had not archived stuff, so now we should do it.

Bhaskar Sinha:
How much does a student actually spend outside the institute for studio or field work, or for a presentation? I just want to get a feel of the inside-outside ratio.

Jay Thakkar:
It varies through departments. But generally, there are the two main semesters in which there are a lot of classes. We have a 16-week semester. If you consider that as 100 per cent, out of this 60-70 per cent is oncampus and 30-40 per cent out of it.

Then we have a one-month summer school and a winter school, which are often outside campus. The time students do their thesis and dissertation is when – depending on what field study they have chosen – they measure the time collecting data from multiple areas. The campus is just a base.

Then we have office training for six months, during which time they are again outside, working in somebody's office.

Aniruddha Pandit:
So if you have ten semesters, out of these, six semesters are done outside the institute and four semesters are on campus.

Jay Thakkar:
More or less that.

Abhijit Zacharia:
Thank you so much, faculty from CEPT. You gave us a detailed, insightful breakdown of your departments – the way you handle sustainability issues in the curriculum through your pedagogy and methodology. It is quite a learning experience for some of us because there are very few institutes that actually undertake this level of detail when confronting this thought process in the curriculum.

MASTER CLASS 2:

Engineering for Change

INSTITUTE:

IITB (Indian Institute of Technology Bombay)

FACILITATORS:

Bakul Rao, Associate Professor CTARA
(Centre for Technology Alternatives for Rural Areas)

Bakul Rao:

CTARA started off in 1972 as an Appropriate Technology Unit (ATU) – technology that was appropriate to situations, the 'in' thing around that time. It was triggered by a drought in Maharashtra. A few among the IIT Bombay faculty thought IIT should be doing something for the state of Maharashtra, which was facing a lot of problems. The ATU unit worked not in an organized, formal way, but whatever they could do with support from IIT. There were some success stories about building up a paddy drier, some unsuccessful stories too. The turning point came in 1984 with the Silver Jubilee of IIT Bombay, where a UNESCO team recommended the thrust area of rural technology, and CTARA was formed the next year, with emphasis on product development for rural areas.

In 2005, CTARA tried building a check dam in Gudwanwadi, Karjat. That experience changed the direction of our education programme, and the way we worked with the people. It was a learning about challenges you face when you implement projects on the ground. The thesis of one of our PhD students at that time turned out to be areas our students still refer to – AHP (Analytical Hierarchy Process) which is about multi-criteria decision making, and a Systems approach, using system dynamics tools, which has actually come into our MTech programme.

Though our name says we are 'for rural areas', we find there are issues common to the urban poor and the rural. Our focus now is the benefit of the bottom 80 per cent for core sectors that are concretely deliverable. So each of our MTech and PhD programmes has a core deliverable to the public, the stakeholders with whom we interact. We have labs – for GIS (Geographic Information Systems), chemistry, and sustainability and bio- chemistry – but the main lab is the field.

We started with the core issues of food, clothing and shelter, but as we grow we are including more sectors, such as public health and design, and deliveries, design and implementation studies to a concrete beneficiary. All our MTech projects have a stakeholder with whom we tie up for the initial stages. We feel there is a shortage of development practitioners using technology as a tool. The development sector has very few people from an engineering or science background. That is why we thought of introducing a new group of professionals who are development practitioners, and who will talk the language – social language as well as engineering, mostly through analysis, innovation, management and guidance projects.

The MTech is our flagship programme. It was launched in 2000, with core

courses and the electives. The core courses again are divided into courses that are based on perspective, knowledge and scale. Because we take students from any engineering or science background, the first thing is to bring to them the perspective of development and appropriate technology, and an understanding of public policies and governance.

This is a two-year programme where the first year is all about course work, and the second year is more of project work. The key sectors are water resources, water supply, sanitation, energy, environment and agriculture, also food and health. With these there are skill courses: social science research methods, where the students learn qualitative as well as quantitative methods, system dynamics, project management and analysis. This is the only course that teaches how to design developmental projects –government projects, be it PMGSY (Pradhan Mantri Gram Sadak Yojana) or Indira Awaas Yojana.

An important part is the ten-week field stay, where we send batches of two students to any location in India. Although most of our work has been in Maharashtra because of proximity, we have sent students to Ut- tar Pradesh and Kerala too. We work with three different mechanisms: an NGO, or the gram panchayat, or the CSR (Corporate Social Responsibility) outreach of any industry.

We evolved from just generally sending them to do a survey, to a very structured programme with 22 credits. The work is divided into two parts. The first is the village-stay report, where every team has to survey a minimum of 75 households in the village, focusing more on understanding the situation there rather than data collection. The other component is directed research. Just any village report would neither benefit the faculty in their research, nor would we get any issues which to develop as research areas. Sixty per cent is the village report and 40 per cent is directed research.

The faculty puts in major work with the village beforehand, and we identify where the students will stay. The condition is that the students should stay in a household, however it is. No gripes. Some have gone to a house in Madhya Pradesh with no bathrooms. Girls have stayed like that in Odisha too. They get to understand that reality, and it is a joy to see them when they come back. They are changed people – changed for life. Immediately after they return, we have the field-stay experience sharing, and then they get a month to complete the technical report.

One of visits was to Hemalkasa in Gadchiroli – a dangerous palce – to work with Prakash Amte's NGO Lokbiradari Prakalp. The directed research was a water and sanitation study. They did an entire water audit and sanita- tion study for their campus, and are now designing a treatment plant for them.

In the MTech programme we have 12 TA positions funded by the Ministry of Human Resource Development (MHRD). A lot of students are self-sponsored, but we have some fellowships, one of which is from the Ministry of Rural Development (MORD). The idea is that they are hired by the MORD once they finish their MTech. So their entire project work, which starts from the second year, is connected to rural development and to the

MORD. We have come out with some common programmes – one student, for example, is studying the PMGSY. Finally, all the projects feed into the MORD fellowship programmes. Similarly, we have five fellowships from HAL (Hindustan Aeronautics Limited) under their CSR.

In the second year the students have to do a project. Most of the departments in IIT have one-year's continuous project work. We have tried to break it into two sections. The first stage is understanding the situation and assessing alternatives. Students may not have made up their minds about what they want to work on, so this is to give them a chance to see what they want to do. It also gives the faculty a chance to see if the student and project match. So this stage is mostly about tying up with stakeholders, trying to understand the problem, and getting the literature in place. The second part is about the technology of policy generation.

Till today, we have had ten batches and represented more than ten different branches of engineering. More than 120 students have graduated. We have sent them to different sites for field work. So we now have actual data from these villages around some issue, and are trying to see if, after five years, we can go back to the same village to see there has been a difference. The projects can be divided into Technology Development and Technology Assessment. Work is done on the analysis of technology and the context in which it is to be used, on the primary sectors of understanding core environmental or social issues, and also in policy making and policy analysis.

We have evolved a system called the Technology and Development Supervised Learning (TDSL), and all the courses have six credits. Most of our work is demand driven research. We have a very close interaction with the stakeholders we tie up with for our projects – whether NGOs, government departments or gram panchayats. Out of our nine faculty members, only two have formal Development education. The rest of us have come here by choice. So we don't teach the subject in the typical way, but explore a lot. As an offshoot, we now have a policy centre in IIT.

As was discussed earlier, at CTARA too placement is a challenge. It is not a sector known to many people, and a difficult sector. Realizing this, some students would want to go back to the core sector in which they graduated. Some would try and register with some other department for a pro- ject. So we have made a condition that the project has to be associated with CTARA. Even if it is floated by some other faculty it should have to do with development, so that finally it is deliverable to the public. It is always easier to work in your core sector. But we are trying to get students out of their comfort zone – to go to the people, go to the field.

Our 25th year celebrations brought up a lot of questions to measure what we have delivered. How do you get problems from rural areas and small towns to the attention of science and technology institutions? What can the CTARA model do in this respect? Can it, or should it, be replicated elsewhere? Finally, is the focus on field studies diluting our work? How can we bring in more rigour? How do we mainstream sustainability?

At another time we also wondered whether CTARA should remain a centre or become a department of IITB. A department is usually expected to have

a BTech programme as well, whereas now, apart from TDSL, we have a BTech minor. We also discussed whether three specializations were needed. Should we stick to our core sector or go ahead with different ones? The outcome is that we will soon become the Department of Development Science and Engineering. We will not have three specializations, but stick by T&D now that the policy centre is also in. But the broader idea will be development through technology.

The second part is the ongoing study of the engineering education scenario in India. There are three kinds of teaching/learning institutions – centrally funded, state funded and private. In all of them, there is little accountability of R&D or engineering registrations to the end user. There is no systematic data. We produce more engineers than the USA, but what are they doing for the development sector? Even IIT graduates are not doing engineering, though the IITs are high in rankings by the National Board of Accreditation, and the IITs' Act says that we owe to civil organizations, to the people and also to industry. A lot of them go to super global-global companies. There are very few in the global-Indian or Indian companies where the pay is lower. So there are no engineers from the IITs in the core sectors where they should be. In research, the number of papers in the core sectors of water, sanitation, public transport and power grid is much lower than those in neural network, fuzzy logic and so on. Are we investing in the right sectors? What is happening?

There has been a correlation between the provision of urban amenities, such as water, to industrial growth as well as the development of rural industry leading to industrial growth and higher HDI. Clearly there is a strong demand for basic services, which should come from engineering institutions like IITs and regional engineering colleges. But they are addressed mostly by international social science programmes or multilateral agencies in international energy or engineering.

What was pushed to becoming the work of CTARA has come back to the IITs and IISC as Unnat Bharat Abhiyan (UBA) – its two main principles are that you have to go to the people and bring back their engineering related problems, and you have to build case studies to be taught in your curriculum. This is a mandate to all IITs and the IISc. However, there is no funding for this. So how are we to do it?

Broadly speaking, UBA plans to align curricula and research with regional development needs, emphasize field work and case studies, and provide access to the professional resources and expertise of the institutes of higher education. If a gram panchayat needs some help, it goes to consult- ants who are not of good quality, or don't have the capacity to help. Could regional engineering colleges be the source of help instead?

IIT Bombay and TISS (Tata Institute of Social Sciences) have been appointed for capacity building and a change of ethos in technical institutions. Universities, through jobs, feed into companies and to the govern- ment. But there is nothing that goes to the people, whereas the support for institutions is from the people. How do we build this link where the universities can actually serve the people as well as the government and companies?

Because UBI didn't have any financials in it, we pushed it at the state government level, and there is now a government order called the Unnat Maharashtra Abhiyan which provides the necessary mechanisms for engaging universities to carry out work. CTARA ties up with regional engineering colleges, apart from talking to the Collectors or the gram panchayats, to link up in trying to solve the problems of the people. So while we provide support to the universities by coming out with reports, we also engage with the Collectors who have an innovative fund to channelize into research.

What this would need from the regional engineering colleges is the academic freedom for the institution to offer regional projects, and develop regional areas of expertise, skills and training – interdisciplinary skills, applied social science, (fieldwork, reporting and data), and incentives for the faculty and reporting avenues. There are ongoing talks with the Higher Education department in Maharashtra to see whether these reports, if they are implemented in the regional areas, can also be credited to the faculties to provide incentive. Recommendations have been made to the AICTE for how to bring in student projects into development, create more space for electives and minors, and create a departmental developmental area for R&D work at the institute level.

The outcome for us is our learning through the regional colleges, and work- ing with real problems and solving them. For state governments, working with engineering colleges will be much cheaper than hiring consultants. For regional institutions, it will mean necessary research grants coming in, and also the faculty and students getting interesting projects. For students, it will showcase that they have done primary work. And of course, it will benefit society at large. This is nothing new, but in consistency with the international standards set by the Washington Accord and also the ABET guidelines.

An interesting thing we have come out with in CTARA is a development cell – Technology and Development Consulting (T&DC). So while we do our research, we hire students for consulting work, or as research or programme or project assistants. It provides incubation and training for them to go out and start their own consultancies.

What is it we do towards sustainable development? If we summarize what CTARA has been doing, what started off as a triple-triangle or triple-bottom-line concept has now gone into the doughnut phase of sustainable development. **Basically, we are looking at sustainable production, sustainable consumption and sustainable livelihood.** We have tried to divide CTARA's work into four components. The base is environmental systems, where you are actually talking about processes – the evolutionary and transport pro- cesses – which lead to the four spheres that interact. This is where the basic understanding of the systems comes in. Upon that, we have the engineered systems, like forestry and agricultural. Above that, we have wa- ter resources as the base system. Above that, there's water supply – the services sector – followed by the social systems and, finally, the govern- ance systems. All our projects have to be involved with, to some degree, in one or two phases.
I am not aware of any networks in India for sustainable development. But there are two abroad – the Association for Advancement of Sustainability

in Higher Education in the USA, and the Regional Centre for Excellence on Education for Sustainability that is in the United Nations University. A few vcolleges in India are associated with them. The point is, unless sustainability moves from being just education, it may happen that we will be addressing only three systems. What about governance systems? How do we work on the potential of the institutes to redefine themselves?

Q&A

Kishore Joshi:
At IIT Mumbai, do you have a Development Studies programme? I know there are many economists and others working in the area. But largely, the persons you have mentioned as being associated with CTARA are technocrats.

Bakul Rao:
Developmental Studies is, in fact, our core subject. Development theory is taught by faculty from HSS (Humanities and Social Sciences). We are in the process of hiring people who are with the development sector, so it is not that we don't want them. The focus is on technology and development. Most of us will still have a technology, engineering or science background.

Sudha Rajamani:
I have a general question, also valid for CEPT. How easy is it to work with government officials? I am a Marathi speaking person and can manage in Hindi, but I have noticed that in Pune if you go to an RTO office, for example, they will refuse to reply in Hindi or in English. English is out of the question, probably. So do you have to be Marathi or Gujarati speaking to have to work with many of these people in your states?

Bakul Rao:
I am not Maharashtrian.

Sudha Rajamani:
But you speak Marathi.

Bakul Rao:
I speak Marathi, but in a way that might make them laugh at it! That clears a lot of the initial awkwardness. However, the brand IIT often works. We have tried it from bottom up. Where it doesn't work, we go from top to bottom. Sometimes we get kicked out. Persistence is required. There have been cases where we have completed a study and gone to the chief officer who said, "I don't want it. Just keep it there and go. I have consultants." So we use those case studies for other things. Then we approach him again.

Sometimes we have people from the government in power coming to us, sometimes people from the Opposition. We work with political people, NGOs... Wherever things work, we work.

Urvi Desai:
We also have had a similar experience. For many years, some of the professors who teach have been active in consultancy research or

developmental project work. They often know officials in the upper hierarchy. So if at student level things don't work very well, then as an institution we give it a little push if possible. If that doesn't work, we approach individuals to personally talk to somebody so that the students can get access points. But usually, language has not been such a problem, as lack of time. Even with projects outside Gujarat, language has not been the major barrier in accessing anything.

Pravat Kar:
I am curious. If PRA [Participatory Rural Appraisal] is one of the core components, how does the student deal with the public without language being a barrier?

Bakul Rao:
The two students who went to Gadchiroli didn't know Marathi or the local tribal language. One was from Karnataka and one from Chattisgarh. The Kannada student actually found a lot of words common to Kannada and the tribal language. They were able to communicate and do things. Each student tries something. What works, works.

Pravat Kar:
So you could say that part of their learning is to learn by doing whatever...

Bakul Rao:
They know what we have to do. They are trained.

Bakul Rao:
We tried to see if our reports could be considered as publications, but were told no. So we have to publish in journals, and that is a part of what we call our assessment area.

Mona Iyer:
Are there CTARAs in other IITs? If they have to have one, how difficult would it be?

Bakul Rao:
There are centres in various IITs. But CTARA is the only one with an academic programme. The Unnat Bharat Abhiyan is anchored by the centre in IIT Delhi. IISc has ICER.

Now we have approached the Ministry of Public Enterprises to include CTARA's T&D under them, so that our students get hired in the government under CSR. We are trying out various things. Maharashtra has a thousand villages. We want our students to go and work there for two years. Placement-wise, we are better now. But other IITs have gone far ahead.

Urvi Desai:
You were asking about network with regard to education for sustainable development. I think a network had started in Delhi called PROSPER – Promotion of Sustainability in Education and Research. I don't know how active they are or what kinds of collaborations have been forged under it. But I know that they have a network for collaboration between academic institutions and sustainability.

Abhijit Zacharia:
Thank you so much, Bakul, for this detailed journey of CTARA. I think it is commendable that CTARA has been through such a challenging yet successful journey where you have been able to create a niche and space within an old engineering institute, that too one at the top. You all have countered institutional reluctance in places like this, and have been able to navigate your way through it. It is quickly emerging now, that a strong rural ground connect – a bottom-up approach, as a lot of other speakers also said – seems to be essential as a core, an integral part of all courses.

You mentioned something about developing rigour... There is a lot of cross-pollination of skills by co-opting other faculty into your programme, and other students who are already armed with a lot of analytical and rigour based skills. Having that adds credibility to this whole agenda.


SOCIAL


Western Region
Sustainability
Symposium

MASTER CLASS 3:

Wicked Issues to Wicked Opportunities/Design thinking to address complex Sustainability Challenges

Institute:
NID (National Institute of Design)

FACILITATORS:

Praveen Nahar
Senior Faculty, Industrial Design

Mayank Loonkar
Faculty, Communication Design

Praveen Nahar:
NID is part of the Ministry of Industry and Commerce. We have about 19 disciplines, many outreach programmes, as well as consulting and other activities. There are about 19 postgraduate, seven undergraduate, and some product design programmes. It was founded in 1961 based on the recommendation of Charles and Ray Eames, and has a great legacy.

There are a lot of perceptions about what design is. One of my colleagues defined it very simply as the intentions and actions that address value, and he used fire as a metaphor. Design is not just a discipline by itself. It draws from all other domains –technology, science, philosophy, literature, humanities, social sciences, economics, art, law and so on. There are de- sign opportunities in any setting – in society, nature, work, play... But it is built on a lot of sensibilities, and needs abilities for working with situations, people, empathy, observation, analysis, imagination, all kinds of reasoning, creativity, visualization, the ability to prototype and communicate, and things like that.

Fields and disciplines have emerged in the domain that change and expand or get trimmed down – as for example, Industrial Design in the post-mining setting. Ideas about disciplines also keep changing – Industrial Design, Communication Design, Space Design, Service Design, Policy and so on.

There are three sets of requirements for any domain: skill based, which is to do with abilities and the tools of the trade, action and managerial capabilities; knowledge based, connecting with reality (the world, people, environment), and access to specific knowledge and virtual worlds; and cognitive based, to do with motivation, values and attitudes, and empathy rooted in core philosophy. But at the centre of all this is your own value system that underlies it all – your ability, humility and empathy, what you really want to be and why. That brings in attitudes and positions – and sustainability is a part of that.

There is a lot of talk about design thinking these days, even on management and strategy forums. Is it to instil user-centricity and empathy? Is it a means to solve complex problems, or a methodology to foster experimentation? Or is it a buzzword to tell you that designers can

do more than design? It is open to different interpretations, but here is an interesting take: "It is important to recognize that design thinking is not exclusive to designers or unattainable to those in another discipline. Design thinking is natural and inherent in all of us." (Idris Mootee, HBR)

There are values we see in design thinking, like human-centeredness, the sense of inquiry, empathy, iteration, action orientation, collaboration, the ability to reflect, comfort with ambiguity and uncertainties... There is also the dealing with fuzziness and chaos, and being able to visualize and prototype and make something viable – not only physical prototypes, but also conceptual. The means to do all this is through techniques of research, analysis, ethnography, conversations, synthesis and so on.

I will talk a little bit about how we apply design thinking or systems think- ing to complex situations in a classroom setting. We do a ten-week pro- ject every year in both undergraduate and postgraduate instruction. NID essentially works in a block system of timetables, where we don't run courses throughout the semester but go sequentially so that inputs are processed through one or two weeks of classes. The last half of the se- mester is mostly devoted to projects that last for six to ten weeks, and the emphasis on projects goes on increasing as you progress through semesters.

In India, we all grow up in different socio-economic, cultural, geographical and political settings, and experience almost the microcosm of the world. Dealing with diversity is part of our lifetime experience. That means, dealing with complexity is inherent to us. How do we extend that to the profession we practice? Traditional approaches may not always work. In a framework developed by one of our friends, G K Raj Patel, he talks about different orders of design from 1.0 to 4.0. In 1.0 you may be designing a product for communication, without looking at its implication on environ- ment. In 2.0, it's about Service Design which looks at organization trans- formational processes and design. And 4.0 is about societal confirmation. The idea is about how to get into sense-making, rather than designing for the sake of it.

We try to take this approach in our courses – so Product Design isn't nec- essarily restricted only to products. We look at Design thinking, which is the ability to look beyond iterative and creative processes, geo-centres and bottom-up approaches, to generate multiple ideas, scenario-building, visual expressions and so on. How can these abilities of designers be connected with tackling complex challenges – socio-cultural, economic or environ- mental – and be sustained, so that they work with empathy and complex- ity but some clarity starts emerging? How do you also develop this ability to deal with macro-to-micro-to-macro and switch between the settings? We use a lot of visual mapping and modelling, and try to make inter-connections. Based on those, we do opportunity mapping and find individual pathways for those specific projects by attempting system modules, pro- jects, communication, policies, and service or infrastructure responses – any level of responses. There is a whole range of ideas between product and no product, and some things make sense.

This is a process framework set out in the curriculum, which is for ten weeks and involves application of systems towards complex design prob- lems.

We take team based projects that involve a wide range of problem areas. But it actually works when you look at existing situations – you an- alyse them, make model maps, build scenarios and strategies, implement them, do follow-ups and all that. There is some fuzziness in the process that might be confusing and frustrating. But this is a very emergent andalyse them, make model maps, build scenarios and strategies, implement them, do follow-ups and all that. There is some fuzziness in the process that might be confusing and frustrating. But this is a very emergent and iterative process. Students go into their individual projects with a lot of uncertainty but when I walk into a class in the middle of a project, I find a strong sense of ownership among them.

We try to see a lot of situations from the wicked problems perspective – problems that are almost impossible to solve. We try to figure those out and create a situation where the situation selection itself is a process. This goes on for the first few weeks of the project, getting redefined almost every week. We also try and build a common understanding about what this generation is thinking, what their point of view is. There is a lot of field research, of actually going out and engaging with the stakeholders/users, bringing back insights, mapping and putting them down and trying to find connections. Visual information is structured and put into the framework. Visual metaphors are used to represent the core of the project. All this information is taken back to the stakeholders.

In the last few years, we have been doing a lot of co-creation workshops, not only with people at the ground level but also with policy makers and others, depending upon the situation and the problem. Concepts and sce- narios are developed. Prototypes too are sometimes built and tested.

A group of students had, for two-three years, worked on rural maternal health issues. They looked at medical infrastructure and economics at many levels, and found that almost 1.1 million women have died due to maternal health issues, before, during or after delivery. This led to all kinds of responses, like finding out where health policies are successful and where they are failures, how to improve communication systems based on IT and information flows, looking at products, services and systems, looking at the vulnerability and future of street workers, the kinds of policies and services needed in growing cities, and so on.

After an earthquake in Sikkim, students mapped out response systems based on insights they gathered from similar situations around the world – the kind of actions that had to be taken before, during and after the quake. Sometimes they work completely under unfamiliar situations – like finding out issues of the people working in the salt industry. In another project, where the issue was water, they ended up developing a DIY kit for water desalination so that people could use resources available there.

Then there was a project about the Jaipur foot, which is now supplied to probably more than 29 countries around the world, all war-affected countries. The problems were about the foot not being not of the right size, or the right colour for the place it was being sent to. They wanted us to standardize it. But looking at earlier design interventions on the standardization of this foot, we found that a lot of other things had to change to make this possible – production processes, how the foot is

assembled, and the communication across distances. We ended up almost delivering a strategy for organizational transformation while also designing.

We have looked at issues in pre-school education in the context of anganwadis, as well as at judicial reforms and reducing the huge number of pending litigations in the courts – can the time to make decisions be reduced, and if there are any court rules around the whole system. We have worked with menstrual awareness and waste management – how to remove the taboo around menstruation, experimenting with the idea of re-introducing cloth pads, and better waste collection and disposal. We have also looked at transportation systems and tried to grapple with things like DIY solutions using future technologies, what kinds of mobility systems would have to be adopted if 20 years down the line the GRTS system in Ahmedabad moves to the next level.

Whatever the problem, we look at it from various perspectives and try to see what design can do. We set up peer-to-peer learning settings where people work together and react to each other. As I said earlier, we used a lot of mapping, modelling and making everything visual, so that it helps make connections.

Basically, this whole approach is design thinking, and systems and complexity of issues complementing each other. In the process, we also end up sensitizing the stakeholders and develop future networks and ways to practise design in completely unknown territories where nobody has looked at design earlier in those settings. The framework is always very reflective, evolving and trans-disciplinary, and occurs at various levels. It also brings in some amount of empathy, patience, humility, modesty and a sense of ethics in individuals. And hopefully, students become active thinkers, as it urges a sense of leadership.

When I was preparing for this session, I realized that one-and-a-half hours was too long for an oral presentation – and too short for a workshop, but I thought I would attempt that. I want to introduce this idea of wicked problems. It is something we may have to come across in many of the sustainability challenges. For simple problems, both the problems and the so- lutions are known. Complex problems are where we know the problem but not the solution. But wicked problems are those where the problems and the solutions are both unknown. Our complex interconnected and interde- pendent world is pushing us into wicked problem territory, and traditional problem solving strategies are not going to work – they might actually make the problems worse.

Here, in the short time we have, we can make an attempt to understand them better through design thinking and creative approaches. What are the characteristics of these problems? About 10-12 characteristics have been defined. There is no stopping rule to following a resolution, no objective access to a solution, no immediate or ultimate test of a solution, no one-shot operation, no set of well defined potential solutions, no room for trial-and-error, and every attempt counts significantly. Every wicked prob- lem is unique. Every problem is a symptom of another problem.

The causes of wicked problems could be explained in various ways. There is nothing right to be wrong. There are also super-wicked problems that

have been defined. In many cases, due to things like climate change, time is running out. Another super-wicked characteristic is that seeking to solve the problem is also causing it. We are very anthropocentric. People think that they are the only beings in the world – that is the main problem. There are also other species in this world too, and no central authority. Policies discount the future irrationality.

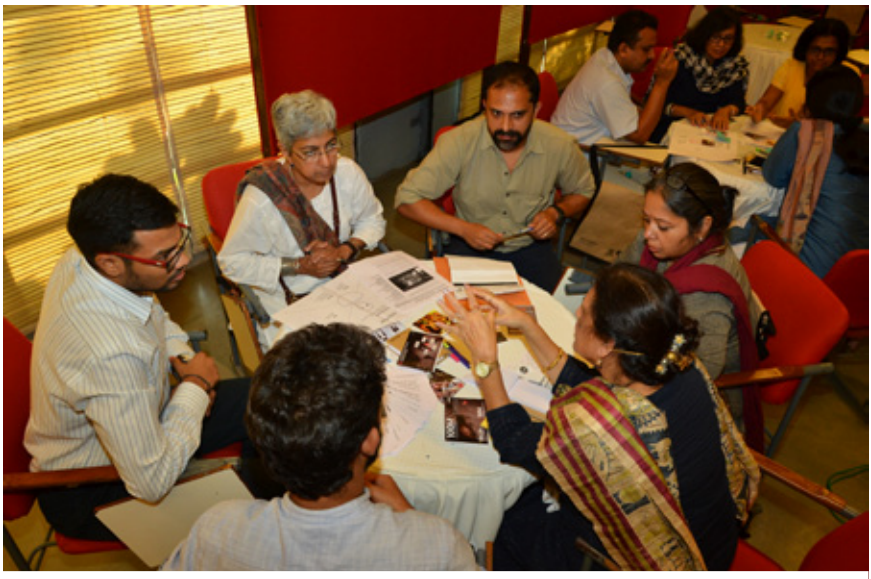
Wicked problems, of course, could be environmental, social, economic or political. There are all kinds of things and combinations of many. If you have to address them, you have to be formulating them – tracing them to their source, finding out multiple perspectives. Through group interactions we can try and generate ownership of some of the problems, by creating a sense of empathy and so on. Making use of visual methods facilitates this, and also focuses on relationships between distinct entities rather than variables, looks at possibilities rather than probabilities, and there is a more coherent sense of commitment.

As I said earlier, design thinking uses a human-centred, creative, iterative and practical approach to problem solving. And this taps into capabilities that are often overlooked by more conventional problem solving practices because of the reasons I mentioned earlier. So there is no fixed recipe. We explore the undeveloped area of design thinking and social innovation. There is a lot of visualization that happens.

So here are five scenarios. We have quickly downloaded a couple of articles – not necessarily very highly researched but they give an idea of the issues. There are some visuals, infographics and data. Again, not highly researched data, but just to trigger conversation and bring the groups together.

GROUP BREAK OUT SESSION

(Praveen hands over packs of clippings relating to an issue, data charts to be filled in and instructions on how to go about the exercise of opportunity mapping. The groups engage in discussion, reflection and segregation of proposed outcomes to go on the charts).



02
DAY

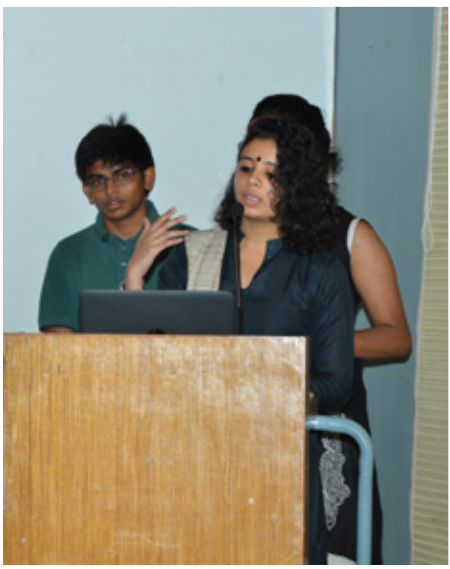
SESSION 01

STUDENT PRESENTATIONS

The student presentations is a session where student groups from NID, CTARA AND CEPT displayed their sustainability related projects on multiple platforms which included working models and posters. Through their presentations, they provided an insight into how using core disciplinary strengths one can tackle issues of Sustainability within the curriculum. Many of the projects were work-in-progress; and some of them have seen completion.


WIPRO


SOCIAL SEVA



SESSION 02

PANEL DISCUSSION: CHALLENGES AND BEST PRACTICES: LEARNING FROM EXPERIENCES

PANELISTS:

Nirja Mattoo
Chairperson, Centre for DOCC, SPJIMR

Ranjini Swamy
Professor, Organizational Behaviour, GIM

Prakash Rao
Deputy Director & HOD, Energy and Environment, SIIB

Shambu Prasad
Professor, General Management, Strategy & Policy, IRMA

Ram Mohana Turaga
Associate Professor, Public Systems Group, IIMA

R M Turaga:
I have the honour of moderating the session today on Best Practices and Learning from Experience related to sustainability education. We have four excellent speakers as part of the panel.

Shambu Prasad is a professor in general management at the Institute of Rural Management, Anand (IRMA), where he coordinates the Centre for Social Entrepreneurship and Enterprises and the Verghese Kurien Centre of Excellence. He has been involved in promoting social entrepreneurship and helped IRMA launch its Incubator for Social Enterprises recently. He was awarded the Villgro-CSIE Award for academic contribution to the field of social entrepreneurship in April 2013, and was also a Fulbright-Nehru Research Fellow at Cornell University, pursuing research on System of Rice Intensification.

Prakash Rao has 33 years of experience in the field of energy and environment management with interest in climate change, energy and sus- tainable development. He has a PhD from the University of Bombay and has led the Climate Change and Energy programme at WWF-India for nearly ten years, coordinating its global research, energy policies and community action. He is currently Deputy Director and the head of the Energy and Environment Programme at the Symbiosis Institute of International Business, a constituent of the Symbiosis International

University, Pune, and he conducts courses relating to climate change, governance and corporate sustainability.

Ranjini Swamy is a professor of Organizational Behaviour at the Goa In- stitute of Management (GIM). She is an alumnus of our institute – a Fellow from IIM Ahmedabad. She is interested in the field of management education, ethics and corporate social responsibility. She organized a UN Forum in Goa last year called 'Principles of Responsible Management Education' (PRME), where I was also involved. She is currently working on setting up an Indian chapter under PRME.

Nirja Mattoo is a development professional. She worked for 20 years with various NGOs like Aga Khan, Plan International, etc. For the last 13 years, she has been working with SPJIMR (S P Jain Institute of Management and Research) in Mumbai as the Chairperson for the Centre for Development of Corporate Citizenship. She was shortlisted twice for the Faculty Pioneer Award by Aspen Business and Society in the US. She represented SPJIMR at the UN Global Compact Champion meeting at PRME and Bottom-of-the-Pyramid World Convention.

We will not have presentations, but arrange a set of questions related to the theme and pose those to our panelists. Most of the questions will be those for which I have no answers, and probably not many of you will either. So we will learn from them what those answers are.

The first is something out of syllabus, based on the one-and-a-half days of discussion that we had. When we talk about sustainability education, do we have some shade understanding of what it means in the higher education sector? Is it necessary? For example, in management education we know that the core courses are Finance, Marketing... It is an open question I would actually pose it to everyone here. And I think it is important because in designing a curriculum around sustainability education, maybe we need to understand what the essential elements are. It is a highly inter-disciplinary enterprise. So depending on where it is taught there will be more emphasis on certain areas than others, but are there some core elements?

Prakash Rao:
I will share a quick experience of what we went through when we devised this programme. It commenced in 2009, although the work towards initiating it started off by 2007-8. One of the first things we did was to see whether there was a requirement for professionals who could actually be involved in looking at sustainability when they go into such sectors. Quite often, people set up the courses and then realize this. A lot of things are placement driven, particularly in B-schools.

So it was essential to **first understand if we really needed to start this course. We knew at an emotional level that it was important, but was it feasible?** So the first thing we did was talk to industry professionals who then became part of an institutional group within our programme – saying that since you have given us this feedback saying yes, it is necessary, you are part of it. They also gave us ideas about potential courses, and continue to advise us every six months on whether something is working or not.

Seven years down the line, we have actually modified the curriculum a lot because the field is so dynamic. For example, Climate Change is an integral course we still conduct. But earlier we had a specific course on CDM and Carbon Credits, because those were the big days of CDM and a lot of carbon credit work happening around the world. Today we do not do it, for obvious reasons. But then that has got replaced by other regional market mechanisms that we have now introduced. India itself has come up with some new mechanisms.

So we are evolving. The industries have been quietly giving us the feedback about the curricula we should implement. Of course, there are other insti- tutional challenges. It is not as if we have been able to handle all of it, but I could touch upon them in the course of the discussion.

Nirja Mattoo:
Our story has been slightly different. Twenty years ago, we thought that there was something called management education that would sensitize students to becoming responsible managers, rather than just a manager for the corporates. We thought that the best way to sensitize them would be to send them to rural areas where they could understand what underprivileged society was all about, and to appreciate the work non-govern- mental organizations were doing for society.

With this objective, we started this whole initiative of non-classroom programmes. We thought that experiential learning could really bring a change in a student's life, rather than giving them a classroom kind of instruction or knowledge. Let me tell you, it was not easy 20 years ago. Our dean had to face a lot of challenges. The students did a dharna because they felt this was not the kind of work they thought they'd be doing, in places like Bihar and UP, rather than becoming managers or CEOs of corporate houses.

But commitment and innovation in any kind of education is a challenge. New ideas are not accepted at one go. We had a faculty revolt, student revolts, parents questioning... It was really the commitment of our dean, who said he would close the institute if the programme couldn't continue. And he said it was not voluntary but compulsory – a three-credit course. I think that made things a little worse for the students. But once they went, there was a sea change because it really was a great learning that would stay with them lifelong. It was not just contributing, but also something they gained.

There are two aspects of a student's life – contribution and consumption. We are all the time consuming, from everywhere. How much have we really contributed to society? We wanted to add value to the students' knowl- edge and also to their lives.

Once there was a change in their attitude, it started rolling and is one of our flagship programmes today. We think it has changed not only the at- titudes of the students, but is sustainable in terms of all faculty members involved. The placement scenario really has changed because now all recruiter agencies are looking at rural areas where there is a huge emerging market.

Today this has become a way of life for the institute, and brought in a lot of awareness, not only to our students but also to the NGOs with whom we work. Our students go work with NGOs, live in that area, and we make them much more effective and efficient through management education. So it is a win-win for the NGOs, it's a win-win for the students, and is great for us in terms of understanding what the rural market is all about.

Ranjini Swamy:
We are newbies in this whole thing. We started the journey of trying to make our students more socially responsible somewhere in 2011, when the chairman of our board said we needed to create socially responsible managers. The question was, how could we create these and what did it involve? So we started doing a little bit more of research and found that there were a lot of concepts like this – sustainability and responsibility, and others.

For me, even today's and yesterday's discussions give me the idea that, ba- sically, sustainability and responsibility have to do with improving the quality of life for everyone. Therefore it should be done in an inclusive way, not forgetting a large section of the people who don't have a voice. It should be long-term in approach, so that we are not only thinking about the present but also the future. Anything like this would be a sustainable approach. At GIM, we have focused on improving this inclusiveness by helping our stu- dents to focus a lot more on understanding the plight of the poorer people in society, and being responsive to their needs. It's a struggle still, but I'm glad we started this journey.

Shambhu Prasad:
I've been with IRMA for just one-and-a-half years, so I will have to speak a little more on rural management, which IRMA pioneered. The legend of why IRMA was set up is that Verghese Kurien was on the board of IIM Ahmedabad and was looking for professionals from the IIMs to come and serve the rural sector. The response was, "You want our graduates to milk cows?" Sometimes ego is a good thing, and that is how IRMA started.

The point I would like to make is that rural is important in the discourse on sustainability. In fact, I might even venture to hazard that these discus- sions on sustainability have been rooted in the rural management context for quite some time, and we are actually trying to get sustainability into what we have been teaching all the time.

So one of the things – and we have had a fair amount of discussion on it – is rural immersions. That actually provides both the students and us the imagination of the rural, which is very critical. Even if 50 per cent is in urban areas, the vision of sustainability can come much more from the rural, both at an experiential level and also for the ability to integrate different aspects of agriculture, livestock, forestry and other aspects.

The notion of frugality that we spoke of is critical as well. So a student staying there learns about sustainable consumption, which becomes an integral element that we can possibly build on. Whether we do it successfully or not is a debatable point.

We do have a core course on Natural Resources and Sustainability. In my earlier institute – Xavier Institute of Management, Bhubaneshwar (XIMB) – where I was associated for a whole decade with the rural management programme, this has undergone a lot of change. The discussion on sustainability needs to be rooted within a larger context of environmental move- ments and other discussions that have been happening – so it is not a five- or ten-year kind of phenomenon.

Many of us have actually had to rephrase and rework things. I would like to refer to Father Bogot's interesting paper, written a long time back, where he made this contrast between a business leader and a watershed leader. I give this to students, saying "Do you think it is still relevant today? How do we rethink this notion?" Today, we talk of Swachh Bharat, but watershed as a concept has gone totally out of vogue, in some sense.

The important thing about rural management is to bring in those notions of thinking about sustainability. But there are challenges of how we can in- tegrate these within a programme. At XIMB, we started off with a course where we used to have a field work component. Once the batch size in- creases, it becomes difficult to do this. Natural Resource Management slowly became Ecosystem Management because we thought we had to broaden issues. And then slowly we changed it from Ecosystem to Sustainability. There is always this debate. Nirja was referring to whether it should be a core or elective. We suddenly found that the business management programme has a core programme on sustainability, while in rural management, sustainability was an elective. So that changed.

There are lots of issues to do with scheduling, which we could discuss later. I will stop at this point, trying to suggest that the people working in rural areas have been leaders in sustainability – like our alumni from IRMA. To-day, they get many of the awards for sustainability. There is a lot to learn from experiences that have worked, and the ideas of integration, systems thinking, etc. which we could take from other disciplines too.

R M Turaga:
Thank you for your thoughts. I think what I hear is, given that this is an evolving field, it is going to be dynamic. So we need to be aware of what is going on in the space outside, in practice, and how to incorporate those as we move along. So at this point, probably it is not possible to define what constitutes sustainability education the way we have with management education or engineering education.

The other aspect that is also important, and appears quite frequently in sustainability debates, is the idea of inclusiveness and being rooted in the field, the need for exposing the students to areas aren't otherwise while growing up – rural areas, or where people live in very poor conditions.

A related question is that we have made sustainability a compulsory course only this year, as Prof. Raghuram said yesterday. I have been teaching that course to two-thirds of our batch and although we haven't received a formal feedback from the students, the sense we get is that they think it is not central to what they should be learning in a management school.

IIM Ahmedabad has been running courses related to environment and sustainability for a very, very long time. Professors who have been around for the last 25-30 years tell me that at one time there were no takers for courses on environment management. But over the last 10-15 years, on the elective front, at least 30-40 out of the 350 students we recruit every year are always interested in it. But now that we have made it compulsory for all, there is a sense that it is being imposed.

In my view, it comes partly from placement driven ideas about management education – they don't get signals from the market that this is important. Unless a sustainability course carries some value in the recruit- ment process, they don't feel that it is required. So from outside we might think that all these things are important, but unless from the perspective of students – and for that matter, even of the institute administration – there is the sense that this kind of education, skill and sensitization are valued in the market, they are not going to really care about the course.

Nirja Mattoo:
A few years ago, this was an issue with us too. But since it is a part of the core programmes – PGDM as well as PGBM, two-year and one-year MBA – I think it only adds value to the corporate. What we see now is that most dream companies, like HAL and BHEL, ask students: "What was your experience when you went to Latur and Sangli? What is your insight on distribution and marketing strategy there?" All this is coming up in a big way and our students are getting very good placements. It is encouraging for us because we feel that this is an addition to core learning.

The students too are getting the feeling that this is a big thing now. People from the West – like Cornell University – are coming for this kind of experience. And I am sure this makes a difference not only to the corporates but to the individuals themselves. You can see the difference in their atti- tudes, the kind of teamwork they build in, and the leadership and decision making skills they have learnt on the ground. All of this builds them up as holistic people and managers. It is very, very significant. In my experience, recruiters are looking at it from a different lens today.

Shambhu Prasad:
The continuous challenge all of us are going to face is, how do we root sustainability within our programmes? Sustainability is mentioned in our institute's mission. But in terms of translating into courses, the connect is very weak – even the interest and alignment.

Raghuram shared what happened in IIMA, and these are experiments we learn a lot from. Otherwise, in management education, you start off with learning the functional parts, integrate in Term 4, and so on. The great insight we have from the discussions here is that you can actually start thinking systemically and not necessarily systematically. Getting systemic thinking and integration at an early stage should be an important fundamental element of management education. It works well with sustain- ability, rural management, social entrepreneurship, etc., and we need to be pushing that more. So if IIMA has made that into a course, it encourages us to say we can do so too. So please don't convert it into an elective now!

The interesting thing Raghuram also spoke about was the non-teaching space and the involvement. We should not forget that we do have a commitment to something beyond the market. If we lose that, all these discus- sions are meaningless. We will keep chasing the next recruiter who is not going to come the following year. That is unsustainable.

Ranjini Swamy:
I reinforce that point. It is a really bad indictment on our educational system if we don't create any inner directedness at all. We need to ensure that there is some sort of a feeling for our society. We are a part of this; we have to do something for it.

At GIM, we did not impose it. We did impose the service learning project as part of the core curriculum, in which students serve society and learn through service. They spend 20 days in the first year of their programme – once a week for 20 weeks – to try and make a difference to poor people in the community.

We imposed it, but wanted to know students' reactions to it. So we did a survey a couple of years back that asked: Do you want it to be continued as a core course? We left it open, it was anonymous. Interestingly, 60 per cent wrote in saying that they liked it and it should continue. So there is a lot of hope in the younger generation. A lot of them do feel that we need to connect with society and contribute to it.

As far as administration is concerned, our chairman, who is a very senior executive in the Aga Khan Foundation, was in the financial industry before this and is very committed to social development. Members of the board have also supported us in Give Goa, the service learning project. The top management has committed 15-20 lakh a year to it, which is certainly a measure of their commitment.

We have had some informal interactions with alumni. They have no stakes in giving us hard feedback, and some of them have come back and said, "I really believe that this is very important. But in the world of work, the challenges of continuing with being responsible are immense. There is a tremendous push on quarterly targets and short-term kind of performance. It is not easy for us to continue with that."

So our challenge would be how, despite these pressures, do you continue to hold on to the thread of idealism, of inclusion, and ensure that while companies remain profitable, they also don't endanger society at the minimum? This is very important and we need to look at what kind of curriculum revisions we need to make to ensure that under these pressures, people can still find creative ways of being inclusive.

Nirja Mattoo:
There is a big trend towards social entrepreneurship. We have about 25 students who have left cushy corporate, high-level jobs and become social entrepreneurs. They are doing very well in terms of profit as well as contributing to society. There is a need for us, as an institute, to take up some kind of an idea and give a push to students, some direction.

Prakash Rao:
I have already mentioned that back in 2009, there was clear support from our management to start a programme like this. But somewhere, I think there was a lack of direction. We also realized that we were grappling with the problem of the kind of students we were going to get for a programme like this.

Since ours is a very specialized programme focusing on energy and environment for two years – not a core or a normal MBA programme – we clearly need those who are passionate about this. To get them through the admission process, we use our alumni base and also industries involved in sustainability related activities. Thereby, we are actually building a pool of students who come into this programme with a lot of passion and say that this is their future direction. Today, about 95 per cent of them have jobs the core sustainability sector – energy, power, water, waste manage- ment, or sustainability itself.

For our other core MBA programme, which does not cover sustainability or anything related to energy and environment, we have introduced what Prof. Ranjini was saying about service learning. A directive from the top says every postgraduate programme must have a mandatory two-credit course in this. We have courses on CSR and have recently introduced one called Business and Social Impact Management. Like Dr Turaga said, we are going to see the results of how that course pans out with students who don't have an understanding of it, maybe next year. Of course, the other reason is that government regulations are getting stronger now for industry to be involved with such courses.

Shambhu Prasad:
I want to share an experiment we did. We are not, as of now, measured on sustainability. I think Aspen used to have ratings for universities on this issue, and there were hardly two or three institutes from India on that list.

We know that the agriculture universities actually don't take sustainability seriously because of the Green Revolution paradigm in which they were set. So I asked the students, some of whom were from these universities to do a green rating for all of them with sustainability as a criterion. Otherwise the question stays unanswered. We need to start a conversation on the subject and start pushing it, also do green ratings of the cement industry and so on.

R M Turaga:
I generally agree with the sentiment that we cannot be just serving what the recruiters want as far as how we want to educate our students. There also needs to be some push-back and a demand created for future managers to go into industry and think differently. It requires imposing these courses on students by making them compulsory core courses.

While doing that, the challenge, though, is how to make it attractive to them – unlike marketing or finance courses which they know are central to their future plans and you don't need to put in extra effort to make it interesting to them. From that perspective, I think it is important to see if we should innovate on pedagogical tools for teaching sustainability-type courses in management schools, and even in other disciplines.

While teaching I use videos extensively, not really specific to sustainability education. Videos are the popular option because of their availability on YouTube and all that, but it is an enormous resource. For example, while discussing poor labour practices in multinational companies, we use case studies as primary tools. So now, instead of just lecturing them on how poor the conditions are for those working in, say, Nike's factories in developing countries, we show a video perhaps of a sting operation. This brings them closer to reality. To see how the working conditions are will generate more interest and empathy towards the issue.

In this context, I want to ask the panelists whether they have themselves innovated or come across any such innovative pedagogical tools that help students get more interested in these issues and understand their importance when they go into the real world.

Nirja Mattoo:
I don't agree that these issues are difficult to bring into in- dustry because whatever you do in the company, you are also doing on the ground. It is about relating them and learning from it. So the pedagogy is this whole experiential learning.

When students go into companies, they develop an idea, make a report, share it with the organization and then share it with us. Our programme is well evaluated. It is a three-credit course and there are three components of evaluation. One is on the ground, assessed by the person who is supervising him – the NGO director or the supervisor, who sees whether the student is consulting the organization, is really building a team, how he is building the capacity of the NGO, and so on.

The second component is that he makes a report which has been assessed by the faculty and experts outside the organization. That is where we judge writing skills and how he has analysed the work done on the ground. The third is, how does he present his work to a panel? The panel consists of the NGO's field director, a corporate person, and member of our faculty. How does he communicate in eight minutes what he did for five weeks? This is the assessment of his communication skills.

These are different aspects of personality building, creating a more holis- tic person and manager as well as developing a pedagogy which can be shared with the other students. So whatever every individual has done is either shared in the classroom, or documented and used for students who go into another organization the following year.

This is a continuous process of learning for us, with feedback from the ground. If one year there are problems with students' attitudes, or an NGO didn't behave well with the students, the next year we see how to change that. This is a very inclusive and transparent learning for the organization as well as the student, and is the kind of pedagogy we use.

Shambhu Prasad:
Two things I find useful are experimenting a lot during the course and getting students out of their comfort zone. It is important for an MBA

class to do something beyond a PPT or SWAT analysis and things they do repetitively.

When we talk of sustainability as a do-good thing, it is not enough if you do not understand perspectives of different stakeholders. I find that the video, The Call of the Bhagirathi, which presents the controversy of the Tehri dam very well, opens up the mind even to the fact that the prime minister is going there and talking to someone who is raising a question. These things make a difference to thinking. Students need to discuss conflicts, and understand that we don't have all the answers.

There is of course the other challenge. We try and make students sensitive, but we also have to try and see how we can make them more powerful vis- à-vis the market. That is a different kind of challenge. Sometimes we tell them to do something because it is important to business, sometimes we have to tell them that the ecosystem context is important – that today the top guys in strategic thinking are also talking of the business ecosystem. Sometimes it works, and many times it doesn't.

R M Turaga:
This idea of generating conflict is very important. For example, take a conflict around land for an industrial project. The general sense that these students, who are future managers, have from whatever they learn in the first year is: Why are these guys not willing to leave their land when we are trying to develop this country? This is one perspective, and I am not going to judge it. The point is that they also have to understand why those guys are actually not willing to leave their land. What is their thinking? In the sustainability debate this is very important – that there are stakeholders who have a certain perspective underlying the kind of behaviour they display.

So here's what we do in the course. We take a case with two parties – Nike as a company, and another party that has been raising issues around wages, working conditions, etc. – and randomly assign two student groups to take up for the two perspectives, irrespective of what their individual positions are on the issue. They are forced to think from the perspective of the side they are on and make their presentations.
Each group questions the other, and for 45 minutes there is a debate.

We had five-six sessions where we talked about conflicts and how they posed risks to businesses in the context of sustainability. It worked very well. It forced people to think from the other perspective, which is very important for them when they go out. Part of being responsible is being open to what the person disagreeing with you is saying. We need to develop this.

Prakash Rao:
We evolved a couple of courses around these conflicts. One is on climate change. When we started it in 2009, it was a lot of theory and people were trying to understand the science of climate change and projections, and what was happening around the world. There was lack of clarity, and a feeling that there was no need to know about it.

Then we introduced a level of debate in the classroom. And given that

the climate change debate itself is so politicized around the world today, between the developed and the developing countries, we created that mini divide in class so students could debate on specific issues around agriculture or technology transfer or water. That threw up a lot of interesting discussions, to the extent that I had to step in and say enough was enough!

These are the kinds of models that we, as faculty members, have to look at and evolve. It is not only about a conflict, but also about finding answers to it. While conflicts are important, solutions are necessary as well. Climate change being so vexed a problem, solutions don't come so easily. But students have been thinking of what solutions could be.

The second course I mentioned is on public-private partnership. There can be no drier a subject than this. Initially we had serious problems getting through to students. So to make it more interactive, I give them a topic or an issue – electricity, waste management, water services delivery... Today, these are all issues connected to the environment, dealt with as public-private partnerships, with successes as well as failures. We look at them as stakeholders in the public-private partnership process. There are study groups in class, with about five or six students each, and each of them takes on the role of a stakeholder – an investor, an NGO, the government group, a private sector, and a consultant who creates the detailed project report. They enact the situation in class. I tell them that if they are an NGO they can shout – it is perfectly fine. It sets the mood that the government is perhaps doing something the user doesn't want, or the NGO is creating a hue and cry over an issue, or the private sector is involved in some business opportunity.

There is a lot of learning that comes out of it. Outcomes in terms of solu- tions also come in. Is something feasible? We often use a classic example of how electricity has got privatized in the country today. Delhi, for ex- ample, has its power distribution privatized – through NDPL and Reliance – because of a government system that was not working well, and other locations too. Water is also being privatized in many places, and thrown up challenges. We found this a very helpful learning process.

Ranjini Swamy:
We also do the service learning project, where students work with and serve the community and learn from that. But I will say that while it sounds very interesting, there is a lot of difficulty in making them – and making this – work on the ground. The first thing is that many of the students are not used to looking at experience as a source of learning. The classroom is where learning happens.

The second thing is that tremendous structure therefore has to be provided, and the mentors have to be really active and driven. Now, some faculty are very motivated and some are not. And the amount of learning is a function of how much of attention is given by the guide. Therefore, even when we work with experiential learning projects where the guides are not giving them good attention, have not structured the project and helped them to learn the right things, the projects have failed.

The other thing which we discovered from a small survey that we did of

about ten students is that many of the students come out of this experience of service learning with a positive attitude towards the community, but it doesn't translate into the business sphere at all. So they may do a lot of NGO kind of work in their free time, but as business managers there is no change. And that, for us, is the big challenge – how do we translate these pedagogies into gearing students to think responsibly as managers? At least as far as GIM is concerned, we are still on the learning curve as far as this is concerned.

R M Turaga:
Everyone is on the learning curve, not just GIM. We also have projects as part of the course, and they are one of the evalu- ation components. At least in the courses I teach, I insist that students actually go and look at a real organization, identify a specific sustainability issue they are dealing with, and focus on that – who all are involved in it, and what is the motivation for the organization to deal with that particu- lar sustainability issue. Otherwise they will go and just profile that organi- zation. They will say that ITC works with agriculture – they help farmers. That is not going to be useful.

But what is lacking still – and **we need to figure out a way to deal with it – is a critical analysis of what they see. They are very good at reporting what they see. But there is no analysis that tells us what it is that they have learnt from that experience. That is a big problem. I don't know how to deal with it.**

Nirja Mattoo:
Field work is the time when the mentors can really help the students because through those five weeks there is a lot of monitoring that goes on. Every group is identified with a mentor who tells them what is okay and when to go ahead with something. They keep guiding them.


Western Region
Sustainability
Symposium
21st – 22nd October 2016

Q&A

Aniruddha Pandit:
We produce so many engineering graduates. We have so many engineering seats. Either the seats remain vacant or graduates don't find opportunities. Do we have any assessment of how many professional sustainability engineers are really required by the country?

Prakash Rao:
I can probably touch upon one element of it. I obviously can't give an answer in terms of numbers. But look at the energy sector and the regultions that are coming in. Look at the very specific aspect of energy audi- tors – which is one part of sustainability. Look at how the government has now mandated, as part of the Climate Change Action Plan, a mission on energy efficiency, under which is a list of energy intensive industries and each of them is expected to have an energy auditor in place. That is a straightforward assessment of numbers that we could expect. Those are the sectors of industry directly needing sustainability people. They could come from any of the organizations or institutes who could then step in and be part of a mandatory inventory process of the government.

This is one area where I could straightaway say there is room. We started our programme with an intake of 30 students seven years back – we still have not gone beyond 30.

Aniruddha Pandit:
Do you have any feedback from industry? Since management education is essentially placement driven, are there any indicators available to management institutes with regard to what sort of expertise they are looking for, out of the total number of management graduates they may require in a year?

R M Turaga:
That is what I was saying. It doesn't look like there is any signal from the recruiters that they actually value something like this.

Aniruddha Pandit:
Has this been specifically quantified through surveys of placements? I think that should be the first exercise a management education institute should undertake before starting any course. As you correctly pointed out, yes, you view this particular course as an essential need for the society. But apart from the social angle, qualitative sustainability is not necessarily going to 'sustain' business benefits for industry when they acquire sustainability engineers. So it is mandatory, in my opinion, that all these engineering and management institutes should carry out a survey to as- sess the quantum of such engineers who are likely to find good employ- ment on a par with any other management graduates.

Shambhu Prasad:
I think we are still at a stage where we don't have the answers. It takes one or two institutes to take a bold step and figure this out. And it is already happening, because at least two institutes have opened up

a sustainability management programme, and have this challenge of placing their students. They are figuring out the market. I think it is also a question of taking the initiative, of developing the market and sensitizing it, which might take a while. But a survey alone may not help.

Shambhu Prasad:
Kurien developed a product of Rural Managers and he found a way of getting them jobs.They were meant to be only for cooperatives, but they ended up also with NGOs, and are getting into micro-finance and then something else. So I think if you have a vision, you push and you will find a way.

Nirja Mattoo:
There has to be a starting point somewhere, and then the commitment and conviction come into it.

Ranjini Swamy:
I really don't think we should be looking for a market. There may not be a market. But there is a need from society's point of view to have such people. I don't want to give only Wipro if they want them, and not others – whether other companies like it or not, we are going to dump sustainable engineers on them because we would like them to start thinking of business differently.

Aniruddha Pandit:
That is why I said the qualitative part is absolutely essential.The qualitative part is like environmental studies, where you do not have any quantification of, let's say, climate change, or social realization or source deple- tion. We only have qualitative descriptions. Because, as I said yesterday, sustainability has to have a certain timescale associated with it, and that is defined by the resources, or the types of resources, available.

Ranjini Swamy:
What I would recommend then, is that our own research methods – and other – courses have to be re-programmed.

Aniruddha Pandit:
You are absolutely correct.

Ranjini Swamy:
Then we are saying that basically anyone who comes out with the programmes, which are now re-programmed, would be a practitioner of sus- tainability. There is no question of a non-sustainable chap at all.

R M Turaga:
Are we differentiating between the technical expertise required to deal with sustainability-intensive processes, management and policy issues, or are we not getting the idea of sustainability?

Aniruddha Pandit:
What you are saying is partly correct. There are social issues which technical people are not in a position to understand. And there are technical issues which, if given only to social science people, they will come up with some outdated solutions. So it is necessary for these two things to be...

Nirja Mattoo: ...integrated to fill the gap. Absolutely.

Aniruddha Pandit:
We need an integrated approach that has multiple stages, or layers. Some parts have to be core, so some will actually practise it.

Ranjini Swamy:
I would think that if you are integrating sustainability in the management curriculum, it should carry across every subject. You cannot have a separate stand-alone course propagating sustainability, and all the others saying rape the environment.

Aniruddha Pandit:
I am not saying that. That is why, in the 4th Standard, EVS (Environmental Studies) is a subject you have to study.
Ranjini Swamy: It is not about a subject. It is about an attitude. I would like to differentiate between them.

Nirja Mattoo:
I think it is an approach – an attitude as well as an ap- proach – because that is the way to deal with it. Any situation, for that matter, has to be dealt with that way. And it doesn't mean that you only have to be thinking of a particular kind of sustainability. Anything is sus-tainable.

Aniruddha Pandit:
That is why experiential learning is probably the key factor to understand sustainability, rather than asserting it. So, case study based learning is what the management students need to have, rather than...
Nirja Mattoo: ...creating that situation in the class. Absolutely. This is going out there and learning.

Bhaskar Sinha:
I come from the Indian Institute of Forest Management (IIFM) and we have been running this course successfully for the last 27 years. When we started this, one course was a PG Diploma in Forest De- velopment. And all these questions which you have been asking came up: Where are the placement opportunities? Is there a management institute? Do they get paid well? For any management graduate, the first objective is to get a good placement. But now, from 30 we have now gone to 120. We also have specializations in environment management, development management, and conservation and livelihood management.

There are many issues. As Prof. Shambhu said, are we taking the right kind of students for whom this course is designed? That is the number one objective. We have students coming from some 24 different states, very widely spread. But a majority of them are engineers – almost 60-70 per cent. And 50 per cent of them come with work experience in Wipro, Infosys... well-secured jobs. Some of them are very committed. They want a change from their current jobs, and have decided to choose a sector which is unknown. When I go for placement interviews, many times I ask this question: Why do you want to come to a sector where you are not very secure when you are working in a nice sector and getting a good salary? They say they want to explore and work for society, for a larger cause. And we find that all those students who come committed are

doing excellent work in their field. Every single student is a big brand ambassador for the institute, and for the sector they represent.

If you look at any of the top decision-making people in the country, whether from the UN, or the state, or advisors to ministers, a majority of those who deal especially with the environment, forest development, rural de- velopment or UNDP projects are from our institute. And you will find that they have a lot of pride in what they are doing.

But you will also always find 30-40 students for whom coming to IIFM is not because the sector appeals to them, but because (a) they are assured that they will get placements – because we have 100 per cent placement; and (b) our fees are lower compared to other B-schools, close to 4.8-5 lakhs only.

A lot depends on the faculty, the way they teach or deliver a course – whether Sustainable Development, Climate Change, Ecosystem or Environment Management. That is the feedback of the students. In the electives, where you actually get to know the focus a student is looking for, there is a very mixed kind of response. Some look for electives which they think will help them in getting a job; some choose what they find interesting and what they would like to do.

As far as placement is concerned, I must have interacted with more than a hundred recruiters. There are very few organizations that are very particular to hire a student from a certain stream or who has done certain courses. Getting placed is a very different ball game compared to what you have studied and learnt. A lot of our students, who are probably the best of the lot, are very choosy – they don't necessarily opt for a company that pays the highest. In the lower bracket, they all get placed, but not my premium students. They knew what they want – if they get it they will take it, or else withdraw. An institute must cater to students who are committed, who are willing to explore and experiment... see what best it can do for them.

We have two spells of field work. One is for 30 days, and the other depends on the module and is for about 15 days. Field work is a challenge. We arrange it, so logistics and so on are big issues. We used to take them to two-three different states, so we travelled a lot and hardly spent much time on the job. Then we decided to narrow down to one village for one particular study.

SESSION 03

OPEN SESSION: SETTING THE AGENDA - NEXT STEPS AND CLOSING REMARKS

P S Narayan:
We now move on to the wrap-up session of the conference. While you are free to air your views on a variety of issues that inform sustainability in higher education, your thoughts on certain specifics would be greatly appreciated. What should we do next in terms of the theme and the purpose of this conference? which was, trying to understand a multidisciplinary approach to sustainability in higher education, which is the reason why we tried to get people from design, architecture, planning, management and technology all together. Are there any specific things you have in mind that we should do as follow-ups to this? It could be smaller group meetings or conferences, it could be stream-specific... We are waiting to hear from you because we don't see this conference as an end, but as the beginning of a process of how we build on this. Apart from that, your general thoughts on all that has been discussed are most welcome.

K M Joshi:
The World Bank funded a programme called Refresher Course in Environmental Economics that went on for five years, in which undergraduate and postgraduate teachers of Economics were trained in Environmental Eco- nomics. Such courses on sustainability have also been introduced in management institutes. In these two days, I have seen that small institutes too have been working in the field of sustainability education. However, a student may go through the course and not practise it subsequently. So is it really about just introducing courses on sustainability education at different levels, or do we want that to be practised later?

The Lokbharti Sanosara in Gujarat is an example which must be repli- cated. Do we need to have a case study of that and discuss it? Sudarshan Iyengar, who was Vice Chancellor of Gujarat Vidyapith Central University, would be an asset. He is also associated with Nai Taleem, a programme that encourages sustainability education in school level and higher educa- tion.

I would suggest that the most important thing is to think of the mass of higher education. Almost 39-40 per cent of the students in higher education in India belong to the arts and social sciences, roughly 20 per cent to sciences. How do we inculcate the concept of sustainability education for those masses at undergraduate and postgraduate levels? What we have been discussing during these two days is for elite institutes like the IIMs, which are not even one per cent of the Indian higher education system. What could be the model that can be replicated for the masses? Introducing Environmental Education as a paper at the undergraduate level doesn't make sense, because in some universities no credit is given to them and in others the credit is like that of an optional paper.

So this is probably the next step that I am proposing, to be deliberated upon.

Urvi Desai:
The education in the School of Architecture is not placement driven at all. Coming from that, I am very happy to hear echoes of the feeling that an institution needs to take a position on this, irrespective of the demand in the market. That demand probably can be generated.

At the same time, this very forum gives me hope that the market is listening to institutions. It is the market right now, here, that has organized and called all these educators together. It gives me hope that they are listening, and looking forward towards academic institutions to also test the waters. So I think this is a great platform, because not only are educators figuring out what they should be doing, but it is also the moment where the industry is looking towards educational institutions.

That also ties in to the question of sustainability education on a mass scale. Even if ours is not a premium institute, I have been invited here. If there is debate and conflict at that level of 'premier educational institutions' who are pioneering in their respective fields of expertise – architec- ture, design, business, whatever – then the mass level of spread, I think, would probably take a little more time. It is for these academic institutions to take charge and show the path, within education and within industry.
I think we are at that moment where we need to seize that.

This also ties into the question on shared understanding. I think that's the key that all of us are trying to figure out and work at within our individual domains. At some level, there has to be a shared understanding of sustainable as a concept; and then maybe individual academic institu- tions working in specific domains can come in and see how they can take this agenda forward. It is not that it is going to emerge immediately. But if there is a commitment to at least move towards that, I think that's a good start.

R M Turaga:
Let me respond to some of the questions raised. They are all very important. There was a specific question about how we could introduce these kinds of topics in arts and humanities, which are where the majority of students are. I, in fact, think that they are better educated than the students who come to these premier schools as far as these issues are concerned. The students who come to our schools are the ones who are not exposed to the ground realities of how the world operates. That is the reason why we are much more concerned about bringing those perspectives to them.

I am not saying that there is a need for more structured education in those disciplines as well. But I think they already have a better sense of what sustainability is, what is equity and what is not equity compared to those folks who come to our schools. I agree that there needs to be some kind of structured education introduced around sustainability for sure. But my view is that it is important for us because these are the guys who are going out into powerful positions. And whether we like it or not, eventually, business practices are driven by those people. They have a huge footprint on sustainability.

If you think of businesses today, there are so many studies which look at the externalities created by businesses. And there are some studies

which show that if you actually account for the cost of externalities that businesses create, their entire profits would be wiped out. If you want to include the costs that are imposed on environment and society in terms of how they operate, their profits will be wiped out. So they have a tremendous footprint.

I am fundamentally a policy guy, so I work and present in different forums that are more oriented towards social science and policy and less in business, and what I see in those forums is a complete disregard for business in the conversations around sustainability, which surprises me. When you talk about sustainability, stress on what it is and so on, not referring to business practices is going to be futile, because they cause tremendous impact on it.

It is very important to include what businesses do – the business practice – as part of all the discussions about sustainability. What I see is a com- plete disregard for the role of business in disciplines outside of business schools and research around sustainability in business schools. I could be wrong – and I hope I am wrong.

Urvi Desai:
I'll add a point to this. How can industry and academia then help each other to further this agenda? If we, as educators, can say or write down a few points as to where industry can help us, and similarly, if industry people can identify how educational institutions can help them, then I think we will be able to move forward with some concrete agenda in hand.

Neha Sarwate:
We have been talking about industry and academia and educational institutions. But where sustainability is concerned, we also need to understand that the policy makers are the people who actually implement all these things – which is the government and the politicians. If we don't tackle that group – if they are not made aware and educated – then we can keep talking on this side of the cliff, and the policy makers on the other side of the cliff can be making decisions irrespective of sustainability. So to be truly sustainable and go round full circle, we need to partner with them.
I teach a subject called Environment and Ecology. To students it seems to mean we should not develop, that development is bad. At one point, we talk about things like market analysis and economic development, public financing and policies and so on. On the other hand, we talk about environmental and ecological sustainability. I see that environmental and ecologi- cal planners have less footage in mainstream market driven jobs. I have been hearing about recruiters and how our sensitized students are not absorbed. We need to push that receiving end, which is the market, and sensitize them to actually accept the products of our education system.

Shreya Dalwadi:
I represent M S University, Baroda. The first point that I want to make is that sustainability is not a special approach but a matter of natural acceptance. From 3000 BCE till date, we have survived for 5,000 years. And, as the definition of sustainability says, if we want to survive for another 5,000 years, we'd better be more responsible to the environment, which includes not only the natural systems, but the cultural systems as well.

So I think is not a wall between disciplines, but an approach which has to be a little more natural to be accepted by all disciplines of education. We were able to explain and increase the reception of sustainability by our students when we explained this to them.

The second point is that we were able to get our students more interested when we introduced a spiritual dimension to it. Our students were enlightened to know that the Vedic culture is the only culture in the world to have specified the panchmahabhoota (five supreme elements) years ago, and there was a fear that if we did not respect the forces of nature we would be burnt to ashes. So that element of enlightenment or spiritual grounding makes students a little more motivated to interpret what sustainability is to their area of concern.

The third point leads from here. Each of the disciplines presented here needs to interpret what sustainability is to its domain – for business, management, economics, design, architecture, planning... The understanding of sustainability can be different. We are all confused and moving in circles because it has not been written anywhere what this sustainability means to a manager, or to finance. How do we circulate money in a way that it remains if we stay on this earth for the next 5,000 years? So, one recommendation to the organizers is that interpretation of sustainability in each of the disciplines can be taken forward.

The last point... **When we are searching for a market which accepts gradu- ates of sustainability, or which appreciates the understanding of sustain- ability, it needs to be clearly understood that we are not really looking for people, but we are looking for the link. What are the economic benefits of being sustainable? What are the benefits of retaining our water as clean? If this gets understood, there will be many takers. The economic benefits of being sustainable can be the second step forward for organizations can take. If this is communicated well, sustainability managers and planners will get jobs, everybody in their respective disciplines will get more jobs.**

Abhijit Zacharia:
I would like to quickly respond to one of the points on interpretation. I think that is very important because in Wipro we have been deliberating over this for a couple of years, and looking at the kinds of outcomes – somewhat like the outcomes you can have from a forum like this – especially when it is multi-disciplinary. And what we are thinking is that, potentially, in many of the disciplines represented here you can have the development of some kind of literature that outlines the first principles of sustainability in design, in architecture and so on. I know it is there. But it is probably not there as a compact study which will help students not only in the classroom, but also to understand how they can use this as they move ahead, in terms of decision making and sensibilities.

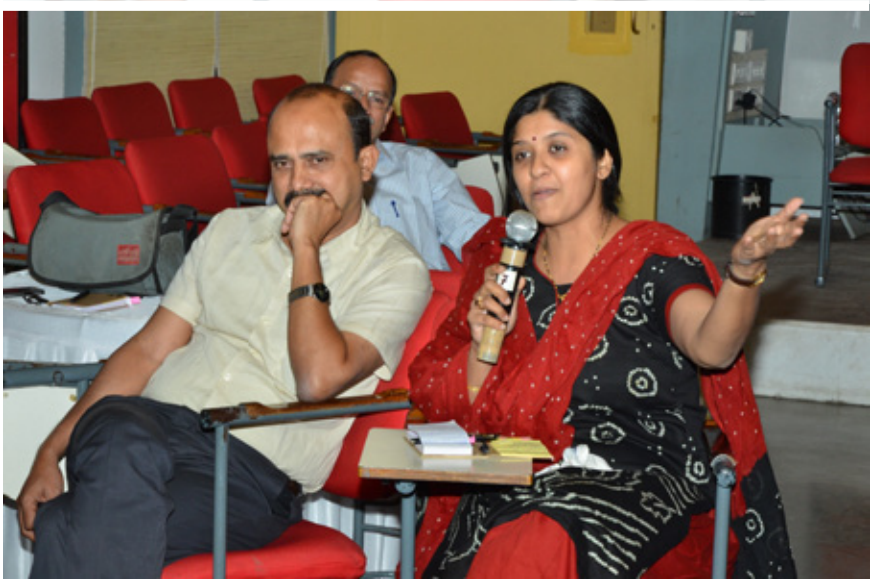
Mona Desai:
The talk here has been employment. I would like to see that vision expand and to include that those we educate today will be the employers of tomorrow – and that age is coming down every day, with several initiatives and funding. Therefore, the steps that we need to take in the way we

educate them about sustainability have to be revised much faster.

These steps are made up of two factors. One is content and one is mentoring. So the role of the mentor is very important, because the mentor will sensitize our young students who will then become employers of tomor- row, and they will imbibe the spirit of sustainability in whatever they do.

Closing Remarks

P S Narayan:
We think the forum was a progressive first step in the right direction. We hope to build on this further through collaborative collectives that further inter-disciplinary understanding of sustainability. In parallel, we will also work with individual institutions so as to strengthen and deepen intra-disciplinary pedagogy and practices as related to sustainability. We are aware that we are in the early stages of a journey that promises to be as exciting as it will be challenging. But we are optimistic that leading academic institutions from across disciplines will come forward in pioneering new paths and in co-creating the change we all want.
Thank you.



THINKING OUT LOUD

I think, this question is probably at the heart of the way things are going on currently: Is the fork in the road something that is inevitable, or can we forge a path that merges all the interests?

Sustainability, therefore, has multiple dimensions. There is an intellect, there is sensibility and there is sensitivity. So it requires the coming to- gether of the cognitive, the ethical and the aesthetic

P S Narayan

Sustainability is more, as I see it, like a value – like inclusive growth. It needs to permeate across disciplines, and how that can be done is a challenge.

Vidyadhar Phatak

Over a period, we have brought in many innovations, but basic resource balance, optimization of resources, circular economy and bio-mimicry – these are the subjects which every engineering professional needs to know.

Aniruddha Pandit

I believe, from experience, that future society is based on three pillars: environment, ethics and empathy.

Shashank Mehta

The discussion on sustainability needs to be rooted within a larger context of environmental movements and other discussions that have been happening – so it is not a five or ten year kind of phenomenon.

There is a lot to learn from experiences that have worked, and the ideas of integration, systems thinking, etc. which we could take from other disciplines too.

=The continuous challenge all of us are going to face is, how do we root sustainability within our programmes? Sustainability is mentioned in our institute's mission. But in terms of translating into courses, the connect is very weak – even the interest and alignment.

We should not forget that we do have a commitment to something beyond the market. If we lose that, all these discussions are meaningless.

Shambu Prasad

Maybe the approach should be to, as far as possible, use relevant Indian contexts, except where you want to consciously bring in an international flavour, rather than the default being the other way round.
Here is the debate: How much do you pander to the market? Because of the market, placement and placement orientation, if these were electives, chances are that not all of them would get much registration. On the other hand, if we believe that this is important and today's manager – who is getting educated to be a manager/leader – should know it, then we make it part of the core.

G Raghuram

These are the kinds of models that we, as faculty members, have to look at and evolve. It is not only about a conflict, but also about finding answers to it.

Prakash Rao

Our 25 years brought up a lot of questions to measure what we have delivered. How do you get problems from rural areas and small towns to the attention of science and technology institutions? What can the CTARA model do in this respect? Can it, or should it, be replicated elsewhere? Is the focus on field studies diluting our work? How can we bring in more rigour? How do we mainstream sustainability?

Bakul Rao

There are three sets of requirements for any domain: skill based, knowledge based, and cognitive based. But at the centre of all this is your own value system that underlies it all – your ability, humility and empathy, what you really want to be and why. That brings in attitudes and positions – and sustainability is a part of that.

Praveen Nahar

So our challenge would be how, despite these pressures, do you continue to hold on to the thread of idealism, of inclusion, and ensure that while companies remain profitable, they also don't endanger society at the minimum? It is very important to look at curriculum revisions we need to make to ensure that under these pressures, people can still find creative ways of being inclusive.

Ranjini Swamy

Commitment and innovation in any kind of education is a challenge. New ideas are not accepted at one go, but when you give it enough time there is a sea change in acceptance and attitude.

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