Newspaper Clips
June 17-19, 2017

June 19

Don't discard your mango peels, they make jams, jellies healthier, says IIT-Bombay study
http://www.hindustantimes.com/mumbai-news/don-t-discard-your-mango-peels-they-make-jams-jellies-healthier-says-iit-bombay-study/story-brReeU5c7yLYupQZR2yPfN.html

The bitter mango peels that most of us discard can make jam and jelly less sweet, and therefore healthier than those available in stores. That's what a team of researchers led by the Indian Institute of Technology – Bombay (IITB) found when they used a process to extract pectin —a gel-forming substance used as a universal additive in jams, jellies, ice creams and cosmetics — from the peels of Indian and Australian mangoes. The study is a part of the ongoing research on fruit waste, based at IIT-B's bio-refinery.

The research assumes significance as India produces 40% to 48% of the world's mangoes.

Currently, pectin produced from citrus peels and apple pomace is imported for Rs700 to Rs900 a kg from Germany, Mexico and China, owing to a lack of manufacturing capacity in India.

WASTE FROM FRUITS A GLOBAL ISSUE

- **Globally, fruit processing industries contribute more than 0.5 billion tonnes of waste.**
- **There is no such data available for India.**
- **But, primary data on waste from mango processing factories in Maharashtra that was part of the study found that medium scale industries produce up to 50-100 tonnes of waste per day.**

In contrast, the five-member team extracted pectin using lemon juice, which is a natural acidifying agent. "Despite being such a vast country, India doesn't produce pectin, which is used in food, confectionery, cosmetics, pharmaceutical products," professor Amit Arora, principal investigator, Centre for Technology Alternatives for Rural Areas, IIT-B.

"India produces millions of tonnes of mangoes, but all we now do is compost the peels and generate biogas. We, thus looked at an alternative green approach, in which the mango pulp is extracted and the peels processed right next to the industry without any hazardous chemicals," he added.

Mango peels consist of approximately 20% to 40% of the total mango processing waste (by weight) generated in industries.

The team conducted experiments on Indian mangoes, which showed that the amount of pectin in mango peels varies from 20% to 30% of total peel weight, as compared to commercial sources of pectin from citrus peel (15% to 20%), apple pomace (10% to 15%), sunflower (15% to 25%) and sugar beet (10% to 20%). To make the process of extracting pectin eco-friendly, the IIT-B and Monash University-led team replaced hazardous mineral acids with lemon juice as the former generates effluents, which need to be treated before they are released into the environment.

Conventionally, industries use mineral acids nitric, sulphuric and hydrochloric to extract pectin that gels in presence of highly concentrated sugar.

“We used lemon juice to ensure that when we use waste, such as mango peels, it shouldn’t result in us producing even more waste,” said Jhumur Banerjee, a doctoral student at IITB Monash Research Academy. “The effluent from the current process is comparatively safer as there is no mineral acid waste as a by-product.”

In addition to preventing acidic effluents, pectin, when extracted using lemon juice, was low on sugar in jams and jelly since it can gel in presence of calcium, which researchers said is “a new concept in food additives for products such as low-calorie food and beverages.”

IIT Mandi students ‘clean up Himalayas’

http://timesofindia.indiatimes.com/city/chandigarh/iit-mandi-students-clean-up-himalayas/articleshow/59209830.cms

MANALI: Students of Indian Institute of Technology (IIT) in Mandi, have initiated 'Clean Up Himalayas' campaign to clean major trek sites of Himachal Pradesh and take Swachh Bharat campaign to the mountains as well.

Pained with unimpeded littering of the Himalayas by both residents and tourists, 21 students, including two girls, and one teacher from the IIT started the campaign from 12,500ft high Beas Kund in collaboration with Discover Himalaya, an eco-tourism promotion agency. The hiking and trekking club of IIT collected biodegradable and non-biodegradable garbage from Beas Kund, Bakarthach and Dhundi areas and returned to Mandi after three days of campaign. Waste sacks were handed over to garbage treatment plant of Manali municipal council.

IIT campus of Mandi at Kamand village is surrounded by mountain peaks. To feed the passion of environment protection among young students, assistant professor at IIT Gaurav Bhutani who himself is a trained mountaineer, motivated them to carry out this task. "We have a hiking and trekking club in the institute. We have been participating in outdoor adventure activities. We had planned to expose students to high altitude trek and also cleaning up of the region. Students did a fantastic job. This was more than what we had expected. All of us have got to learn so many things from nature which is being harmed by irresponsible litterbugs. Such campaigns will continue in future," he said.

Lokesh, a student, who dug out many kilograms of garbage that was buried by others, said, "I am happy that I could contribute a little in preserving the fragile ecology on Himalayas. I am surprised that even educated mountaineers are so irresponsible." Another student Vivek Sharma, who was the group head, said, they tried their best to clean the entire region. "Not only plastic waste but people also threw bottles and damaged camping equipment. Trekking and camping is good but a mountaineer should not leave any trace behind."

"There is no need to collect and bring trash of others but each mountaineer should also not expect others to dispose of their trash," said Nidhika. Another student Garima said, she was surprised by the fact that people who go for trekking to maintain a good physical and mental health, do not care for the health of the mountains. "Ecology of Himalaya impacts a major portion of the world's environment. People should understand that garbage, especially non-biodegradable is making Himalayas sick," she added.

Kaushal Bhardwaj, coordinator of the campaign and co-founder of Discover Himalaya, said the main reason behind littering of the Himalayas is the irresponsibility of the mountaineers. "Workers engaged in several hydel and other projects are also contributing to this. Small but a part of trash is coming from local communities. The students showed great zeal and picked up every single piece of garbage from the area. This will definitely encourage others to pursue a responsible tourism and mountaineering," he said.

HEERA: Proposed higher education regulation needs to overcome many shortcomings

http://www.financialexpress.com/opinion/heera-proposed-higher-education-regulation-needs-top-overcome-many-shortcomings/725189/

The proposed higher education regulation framework needs to overcome the many shortcomings of its predecessors, that too in a changed regulatory context.

The government is proposing to create a new higher education watchdog, which has been tentatively named Higher Education Empowerment Regulation Agency (HEERA). The contours of the body as well as the draft law to back it are currently being worked out by the government, in consultation with the NITI Aayog. The current regulators, University Grants Commission (UGC) and the All India Council for Technical Education (AICTE), will cease functioning to make way for HEERA.

What will be HEERA's role and function?

Although the particulars of the functions the body will be assuming are still being worked out, it is expected to eliminate the overlaps in the jurisdiction and remove irrelevant regulatory provisions. It will bring the regulation of both technical and non-technical higher education institutions under one umbrella. Given how both UGC and AICTE have been roundly criticised for their poor handling of higher education so far, HEERA is likely to be structured in a manner that addresses their particular deficiencies.

Is HEERA the first such proposal since the creation of UGC and AICTE?

No, the UPA government had mooted the proposal for the creation of the National Commission for Higher Education and Research (NCHER), and the Higher Education and Research Bill, 2011 had been presented in Parliament for the purpose. The Bill aimed to repeal the UGC Act 1956, the AICTE Act 1987 and the National Council for Teacher Education Act 1993. In its place, it sought to establish the NCHER, a Higher Education Financial Services Corporation (HEFSC), a General Council and a Collegium of Scholars. The Bill required all degree granting institutions to affiliate with the NCHER. Though it provided for separating regulation and grant-disbursal powers, the HEFSC was to disburse grants to institutions based on norms specified by the NHCER. There were other deficiencies also, for instance, on the question of autonomy of top-quality institutions, the proposed regulator's functions would have impeded this on certain respects. The Bill was withdrawn in September 2014.

A rethink in regulation of higher education was needed because…

The Yash Pal Committee, the National Knowledge Commission as well as the Hari Gautam committee had all highlighted the failures of the UGC and called for its scrapping. The TSR Subramanian committee, which had been tasked with coming up with a new education policy, too called for the scrapping of the UGC and AICTE. UGC has three primary functions—namely, regulation of universities and certain higher education institutions such as deemed universities and autonomous colleges; disbursal of grants; and deciding on and maintenance of education higher education (non-technical) standards—and it has failed on all three counts. With government-run universities (both state and central) and certain deemed universities dependent largely on the grants from the UGC, an inspector raj has flourished. The financial heft of the regulator has only grown since its inception—in 2015-16, it disbursed over `10,000 crore. Though the share of UGC in the government's overall grant to higher education had been falling over the years, it climbed back to nearly 40% in 2015-16, from a still high 33% in 2014-15.

The UGC has also on many occasions impeded institutional autonomy at top notch universities and institutions—for instance, its handling of the Delhi University's four-year undergraduate programmes (FYUP). The criticisms of the programme aside, the UGC initially allowed the programme to run for a year before scrapping it. Meanwhile, the performance of both AICTE and UGC with respect to upholding educational standards is reflected in the less than stellar ranks Indian institutes and varsities

What are the expectations from HEERA?

The Narendra Modi-led government has largely voiced its keenness for freeing up higher education (except the few but significant instances of pussy-footing). Given the larger view that the government has taken on higher education, it will be important to see how HEERA will fit into the scheme of things. For instance, the government has talked of a graded regulation system, with near-complete autonomy for the top-rung institutions, followed by tempered autonomy for middle-rung ones with government regulation earmarked for the lowest-rated institutions. For this, it has proposed a quality assessment and ranking of universities and colleges by the National Assessment and Accreditation Council. HEERA will largely be expected to maintain a distant oversight of the semi-autonomous universities and institutions, while regulating the lowest-rung ones.

As far as the function of funding institutes goes, it is not clear yet whether HEERA will have to do this or not. Given how the government has announced the formation of Higher Education Financing Agency (HEFA) to fund development of infrastructure in premier institutes, it looks likely that at least part of the funding functions of the new higher education regulator will be hived off.

There are developed economy templates of regulation of higher education that the government could draw from while designing HEERA. In the US, for instance, regulation is based on a system of self-reporting by institutions and monitoring by regional accreditors. Accreditors evaluate institutions based on the latter's assessment of themselves—this means a one-size-fits-all approach is shunned. Institutions failing to earn accreditation are not given support for research, infrastructure and other needs.

June 18

Teacher-student ratio set to remain low

http://www.tribuneindia.com/news/punjab/teacher-student-ratio-set-to-remain-low/424087.html

Even as several states and the Union Ministry of Human Resources and Development (MHRD) are keen on improving the teacher-student ratio in schools, the Congress government is maintaining the status quo. It has decided to continue with the policy of the SAD-BJP government, which had fixed 1:40 as the teacher-student ratio from Classes VI to VIII against the prescribed 1:30 under the Right to Education (RTE) Act, 2009.

The Education Department has also decided not to alter the ratio (1:40) for Classes IX and X, as fixed by the Akali-BJP government in 2013.

The department has allowed a 10 per cent increase over and above the ratio while carving out sections of students. This means that a new section will be created only if more than 44 students take admission in a class.

DS Punia, general secretary, Democratic Teachers' Front, said: "RTE says that one teacher should teach a maximum of 30 students in a class. Back in 1965, the Kothari Committee on Education had proposed a ratio of 1:25. The Congress government, however, is allowing 44 students against one teacher."

In a letter to all District Education Officers (DEOs) of the state on Thursday, the department has directed them to ensure carving out of sections in schools on the basis of this ratio. The department is set to initiate rationalisation, wherein teachers' strength in each school is reviewed every year.

Secretary, Education, G Vajralingam and Director, Public Instruction (Secondary Education), SS Kahlon could not be contacted despite repeated attempts.

Meanwhile, the department has decided not to revoke the previous government's decision to increase the number of periods from eight to nine per day.

June 17

IITs Run Special Helpdesk for Female Rank-holders in JEE (Advanced) 2017

https://indiaeducationdiary.in/iits-run-special-helpdesk-female-rank-holders-jee-advanced-2017/

Mandi: In 2016, out of the female candidates who qualified in JEE(Advanced) and whose rank was high enough to get a seat in the IITs, only 38% actually accepted an IIT seat. This was because female students had opted for limited choices during counselling. Their parents, worried for their safety, were reluctant to allow them to opt for IITs far from home. As a result, the gender ratio in the admitted batch across the IITs was a woeful 8%. Recently, the IITs decided on a slew of measures to raise the gender ratio to 20% by 2020.

One measure is a special helpdesk web-portal to advise JEE(Adv) 2017 qualified women on their range of attractive options in various IITs. This initiative is run by over 100 women faculty, students and alumni. Female aspirants, and their parents, can find out first-hand what life and academics are like for a bright young woman in a B. Tech or other 4-5 year UG programme at an IIT. They can talk to the volunteers through phone, email and special Facebook pages. The helpdesk was launched on 12th June via an email sent by Prof. T.A. Gonsalves, Director, IIT Mandi to each of the successful female candidates.

Female Aspirant 2017 portal: https://students.iitmandi.ac.in/other_IITs.php

All IITs offer an unsurpassed UG educational experience. This includes a flexible curriculum that enables a student to find and follow her passion; state-of-the-art lab facilities; world-renowned faculty who through their research are always up-to-date; a wide range of extra-curricular activities including sports, cultural and literary events. The flexible curriculum in which students can take a number of elective courses means that a student who does not get her favourite branch, could pursue her interest through electives and projects.

In this context, IIT Mandi is an ideal space for women engineers in the making. Located in the serene, clean and unpolluted state of Himachal Pradesh, away from the hassles and dangers of cities, IIT Mandi is a completely safe environment for young women. With a fully residential campus hosting 900 students and over 100 faculty, IIT Mandi offers an environment that is as secure as it is intellectually stimulating. We have a unique project-based curriculum, motivating students to work on real-life engineering problems from their 1st year onwards. The excellent student to faculty ratio of 9:1 makes faculty-student interactions easier.

While in big institutions with 1,000s of students there is a high level of competition to participate in extracurricular activities, at IIT Mandi owing to the smaller number of students all interested students get to participate in extra-curricular activities of their choice even from their 1st year. IIT Mandi's women students have, in the past few years, excelled by getting placed in world-renowned companies, by receiving scholarships to study in leading universities in India and abroad, and by winning awards in technical, cultural and sports competitions. The emphasis at IIT Mandi is to enable students in its charge to become competent engineers and good citizens.

On 17th June 2017 (Saturday), IIT Delhi is hosting an Open House exclusively for female candidates who have qualified JEE (Advanced) 2017. This will be conducted by female faculty, students, and alumni. It will be a wonderful opportunity for female candidates to satisfy their curiosity about life and education at an IIT. IIT Mandi will also be present at this Open House event. Dr. Pradeep Parameswaran, Associate Dean (Courses), Ms. Lishma Anand, Head Guidance Counsellor and several student volunteers will be there to talk about IIT Mandi.

Profound social changes have always been sparked by small steps. We in the IITs hope that this step of the IITs will change the face of Indian society in the years to come.

For more information visit:

·Online helpdesk portal with links to many IITs: https://students.iitmandi.ac.in/other_IITs.php
·IIT-D Open House on Sat 17th June: http://bsw.iitd.ac.in/female_interaction.php
·IIT Mandi Facebook for Female Aspirants 2017: https://www.facebook.com/groups/231995973956201
· IIT Mandi website: http://www.iitmandi.ac.in/

Why Is It That Even the Few Women Who Get into the IITs, Don't Want To Join?

http://theladiesfinger.com/iit-women-students/

In 2016, the number of women who qualified to study at IITs was 2,200 (out of 10,500 seats). Of the women who qualified, only a much lower number of women decided to join — just 830 women (about one-third) took up the seats. Now, in an attempt to get more women who qualify to actually join colleges, *Economic Times* has reported that at least five IITs are considering providing fee waivers for women students.

This came after IIT Mandi, in Himachal Pradesh, decided to approve this fee waiver, along with providing a scholarship of Rs 1000 to every woman student starting to study there this semester (it'll also be given to existing students who pass the semester).

Just the 2016 statistics of the number of women who took up courses at IITs are indicative of the very few number of women students in engineering colleges — IIT Mandi itself, has just 30 women students out of 500 students studying B Tech. Now, Delhi, Varanasi, Mumbai, and Ropar are planning to follow in these footsteps. *Economic Times* reports that Ravinder Kaur, who teaches in IIT Delhi, said, "Women do not get a level playing field when it comes to coaching or even funding for engineering at IITs" (it's usually the sons whose education is invested more heavily in). This, it seems, is an effort to address this.

From the students who qualified through the JEE Advanced exams this year, 14 percent are women. It also seems like it isn't only a fee waiver that colleges are planning — *Hindustan Times* reports that a new website that acts as a help desk was launched on 12thJune, to provide women with access to information about life on campus, and studying in the IITs. They aim to address JEE (advanced) data that showed that fewer women opted to join IITs outside their homes or close to home towns because their parents were worried about safety, providing information about all the hostel and residential options that the college provides.

We all know how there are extremely few women in science, technology, and engineering fields. This has always been the case. Even inside colleges, the educational pressures remain, and when added to pressures from family, there are painfully sad stories, like the recent death of Manjula Devak, an IIT Delhi scholar, where her father said she had committed suicide because of demands for dowry. But this new effort being put in on various fronts to address a gender gap in education itself seems to be a great step forward — hopefully it will also begin to address discrimination that women face on the campus too.

5 IITs likely to waiver fee for women students

http://tech.economictimes.indiatimes.com/news/internet/5-iits-likely-to-waiver-fee-for-women-students/59188135

According to an internal study conducted by IIT Delhi, women fare better given an equal opportunity within the campus

At least five Indian Institutes of Technology (IITs) are considering a fee waiver for women students to improve the gender diversity ratio at the country's premier engineering schools.

IIT Mandi took the lead earlier this week by approving a fee waiver along with a monthly scholarship of 1,000 for all women students starting this semester. This will cover existing students as well, provided they pass the semester.

"Almost all our existing 30 women students in the B.Tech programme qualify for the fee waiver and scholarship this year, starting from this semester, "said IIT Mandi director Timothy A Gonsalves.

Of 500 B Tech students at Mandi, 30 are female. In 2016, of more than 10,500 seats at all IITs, only 830 were filled by women, despite 2,200 qualifying.

According to an internal study conducted by IIT Delhi, women fare better given an equal opportunity within the campus --they consistently outperformed males by about 1 grade point on average, despite lower JEEJEE (Advanced) ranks in the 13 years to 2015.

“It is the Indian mindset to invest heavily on sons' education. Women do not get a level playing field when it comes to coaching and even funding for engineering at IITs, “said Ravinder Kaur, an IIT Delhi faculty member who was part of the study. The fee for general category undergraduate students is typically about 1 lakh per semester or 8-10 lakh for the entire programme. Of the students who qualified through the JEE Advanced this year, 14% are women. As in past years, not all will join, the IITs expect.

The schools in Delhi, Varanasi, Mumbai and Ropar are also in favour of fee exemptions for women students. “We will be looking at waiving the fee for female candi dates from next year, “IIT Ropar director Sarit K Das told ET. Das added that improving diversity is an urgent task.

IIT Kharagpur professor Sudeshna Sarkar, who monitors diversity initiatives at the school, also agreed that “some kind of waiver“for women students would boost numbers.

“This could be looked at as an initiative in the future to improve the diversity numbers, “Sarkar said. Fee waivers and scholarships for women students above a cumulative grade point average (CGPA) threshold is one of the recommendations accepted by the IIT Council meeting held last month.

IIT Kharagpur to award its faculty members across age group

http://www.dnaindia.com/india/report-iit-kharagpur-to-award-its-faculty-members-across-age-group-2475707

The awards will be given based on students' feedback on their teaching, peer recognition through national and international awards, research output such as papers and citations, doctoral guidance, research and development activities in terms of sponsored research.

The IIT Kharagpur today announced Chair Professorship Awards and Faculty Excellence Awards for senior, mid-level and newly joined faculty members in an effort to recognise their work in teaching and research.

The institute has announced two Chair Professorship Awards for senior professors and seven Faculty Excellence Awards of which three will be given to associate professors and four to assistant professors, two of them having joined recently. The professors will be awarded on the basis of students' feedback on their teaching, peer recognition through national and international awards, research output such as papers and citations, doctoral guidance, research and development activities in terms of sponsored research and industrial consultancy, patents and technologies developed, among others.

"Such recognition of faculty excellence not only leads to higher motivational factor among the academic communities but also helps students to excel and promotes the institute's brand thus attracting brighter students," IIT Kharagpur Director Professor PP Chakrabarti said. Nominations received by the institute were thoroughly screened, reviewed by experts at multiple levels and final selection was made by an apex committee comprising eminent external experts.

The institute has also selected three of its senior faculty members for Chair Professorships, supported by alumni and industry. "The institute honoured its faculty members in recognition of their excellence in teaching and research. We hope more such awards to be announced with the help of alumni and industry in future," said Professor Subhasish Tripathy, Dean Faculty at IIT Kharagpur.

IIT scientists present India's first 5G patent before global body

http://timesofindia.indiatimes.com/india/iit-scientists-present-indias-first-5g-tech-specification-before-a-global-body/articleshow/59183889.cms

NEW DELHI: With India gearing up for the commercial roll out of 5G (high speed fifth generation of wireless networks) by 2020, scientists at IIT Hyderabad and Centre of Excellence in Wireless Technology (CEWiT), an R&D society under IIT Madras, have tabled the country's first 5G patent before an international body that defines the global cellular radio standards for different generations of wireless network.

Once this global body of seven countries - called Third Generation Partnership Project (3GPP) - gives its nod to the technological specification, Indian manufacturers would be able to use it in their equipment and save huge amounts of money in royalty and licensing fees.

India had joined the international body, which is making standards for 5G, two years ago. US, China, Japan and South Korea are other member countries of this body.

The scientists - Kiran Kuchi, associate professor of IIT Hyderabad (principle inventor of the indigenously-developed waveform technology that forms the backbone feature in the up-link of 5G networks) and co-inventor J Klutto Milleth, chief technologist at CEWiT - have developed the technology under a research support project of the Union ministry of electronics and IT.

Though a research team, commissioned by the government to work on 5G technology, has filed 100 odd patents simultaneously in India and the US so far, this is the first patent whose technological specification has been presented to the world body for examination. Finally, there may be a number of patents for 5G from different countries, depending on different technological specification.

India earlier did not own a single Standards Essential Patent (SEP) before the introduction of the waveform by IIT Hyderabad and the CEWiT. "With this patent and others in pipeline, India can save huge amounts of money in royalty/licensing fees when 5G is introduced in the country. Right now, for every mobile handset sold in India, the buyer pays a certain amount in royalty and licensing to a patent holder abroad", said Kiran Kuchi.

Explaining the significance of this step, he told TOI, "Standards Essential Patents (SEPs) are the ones that are written in the standards that every phone/base station manufacturer has to implement in the device. The SEPs are typically owned by large telecom companies. They derive patent royalties from their portfolio of patents".

He said, "The patent was presented at a conference held in Spokane in US on April 3 by 3GPP. It may take roughly a year or so to get the world body's nod. Once it is cleared, the telecom manufacturers will have to adhere to the specification".

Universities in US, UK or Europe & even China fare much better than Indian in world ranking index

http://www.business-standard.com/content/b2b-manufacturing-industry/higher-education-in-india-does-the-quality-match-rising-expectations-117061700183_1.html

Every year we see the beaming (and super excited) face of a 17-year-old Class XII topper flitting briefly across our TV screens and newspapers – this year it was Raksha Gopal, a young teenager from Noida who topped the examination with 99.6 percent.

The topper lists for the last few years have been dominated by girls and this year was no different - three out of the top 4 students are girls and nationally girls performed better than boys by 9.5 percent - I make a point to mention this because in a country plagued by continuing female infanticide and gender inequality any rise in female education must be celebrated.

All through March & April, over 10 lakh students sat for their XII Board exams (that's just the CBSE number!). Twelve years of education and learning culminated with a set of exam papers – their future resting on how they performed!

For bright students like Raksha, and the 63,000 students with over 90 percent marks, the next step to higher education will be a tad easier; but for lakhs of other students the struggle and uncertainty is only just beginning.

What comes after class XII?

It's a full calendar for students after boards – entrance exams for engineering, medical, architecture, law, defense, etc abound. Students spread themselves thin trying to take part in as many exams as possible – even for the brightest getting admission into a good college is not easy.

There are over 700 universities and more than 37,000 affiliated colleges imparting knowledge to more than 20 million students; while this may seem sufficient, when you filter out geographical areas, courses offered and the quality & ranking of the institute – the competition to get into the right course and the right college is quite cutthroat. In this scenario, an average student is faced with two choices - enroll in a substandard course or pay up to access private institutes.

Before we look at a viable third option for higher studies, let's take a look at what similar students face around the world.

What happens around the world?

While National Institute Ranking Framework (NIRF) and several international surveys usually rank the Indian Institutes of Technology (IITs) as the best among the Indian institutions, we lag far behind in the world ranking index – IIT Bombay was ranked 511 – far behind most of the universities in the US, UK or Europe and even China.

So what are these countries doing that keeps them at the top?

USA: The land of Harvard, Yale & MIT - the US higher education is the holy grail for most students. The higher education sector has a mix of public and private institutions and unlike our system, it is largely independent from government regulation and is highly decentralised. There is no ministry of education! Each institute, including state affiliated ones, is free to choose its own curriculum, teaching methods, course structure and fees. This decentralised nature of the system allows institutions in the US to offer a vast array of subjects and programs - Students have the option of choosing from thousands of courses and can work across disciplines, mixing courses with their main degrees.

Also unlike its Asian counterparts, the US educational system is built around discussing ideas and concepts and eschews rote learning – a quality that pays better dividends in higher studies.

Germany: The largest country in Europe, Germany has some of the most esteemed universities in the world.

It has a federally funded education system, but allows all states to issue its own university regulations and guidelines and German universities are usually given a great deal of independence. Students have access to a huge variety of subjects - almost 18000 degrees and courses, but what sets the German system apart is the strong emphasis laid on methodological expertise, application of knowledge and professional practice.

China: Like everything else in China, the higher education sector has seen sudden and phenomenal growth (largely due to the Government's push to expand university education that started in 1999) in the last 25 years. This year, 8 million students will graduate from Chinese Universities, almost twice the number of students graduating in the US. The country has seen 'massification' of its university system mostly due to increasing demand from a growing middle class and government initiatives and funding.

While top Chinese public universities, such as Peking University and Tsinghua University, are ranked high internationally (an inordinate amount of funding by the government has ensured best-in-class infrastructure and attracted the best brains in the country), there is a lot of debate surrounding the quality of some of the newer private universities.

Takeaways for the Indian context

What constitutes a good higher education system? A brief look at some of the international models have thrown up some key points:

Decentralised & flexible structure

Emphasis on practical learning

Adequate funding

When we look at the Indian higher education system, it falls behind in all three points - controlled tightly by Central Government authorities our system is very far from the flexible and open structure used in the US and Germany, dated techniques and theoretical methods abound and despite the best effort of the Government most public colleges lack infrastructure.

Private institutes in India are trying to emulate the US model – the infrastructure is better and the curriculum is more up to date – but they still have a long way to go before they can rival the world's top universities.

Digital learning: An alternate option for India's learning needs

A few years ago, students started turning to online resources to plug the teaching gap in schools and colleges; now the digital learning industry is projected to reach $ 5.7 billion by 2020 in India. In less than a decade, the quality and credibility (completely in sync with the global standards) of e-Learning modules has won over millions of students across the country. With increasing use of online resources, mobile technology and more reliable Internet connectivity, technology has become an integral part of learning in higher education. Students now have access to a wide range of topics, world class content, pedagogy and certification – anytime and anywhere!

But perhaps the most exciting thing about eLearning is, that it's not just restricted to students; from professionals to pensioners - all can be part of this learning revolution. Whether paid or free, the sheer number of courses offered and the topics covered has made learning stimulating. And the variety of learning methods such as flipped classrooms, virtual learning, simulations, blended learning and so on have put the fun back in learning and changed the way India learns – forever.

And it's all just starting. I foresee some exciting times ahead!