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Foreword

During the last decade, the education sector has dominated economic planning. Despite many new national missions/programs and reforms agenda, by both the central and state governments with private sector intervention, the higher education sector is in a state of complete flux. While we have tremendously enhanced capacity, we lag in quality, given inadequate autonomy to our Universities. Centralized control and a standardized approach remains at the heart of regulations. We are in the 21st century with a mid-20th century regulatory architecture. During this time we have seen countries like China, Korea and Singapore, transform from developing to advanced economies in a decade due to strategic planning and a larger vision that correlated economic development to transformation in the education sector, in particular higher education and research, to become globally competitive.

In this context, the FICCI Higher Education Committee has endeavored to create the 'Vision 2030' for Higher Education in India. The Vision is aspirational and futuristic, looking at India as a globally dominant economy, with a high quality higher education sector that leads and fulfills the needs of society. We have sought to get away from current constraints and challenges looking anew at what we could be by 2030, focusing on the genius and capability of our people and our civilisational ethos, and meeting our rightful destiny as a global leader.

We strongly believe that a stratified three tiered structure that enables seamless vertical and horizontal mobility of students would be able to create the desired intellectual, economic and social value. The implementation framework suggests the student at the center stage to foster innovation and choice, an ICT architecture that will increase access, equity and quality, and a transparent governance framework that will enable autonomy and self-regulation. A framework for governance has been detailed in the addendum document which proposes a mechanism based on outcomes and strong institutional accountability, clearly delineating the role and responsibilities of the government as well as public and private higher education institutions.

We have tried to keep the road-map to achieve the vision, aligned with the excellent policy foundation laid out in Twelfth plan for higher education where ever possible.

We are grateful to the Ministry of HRD, Government of India, Planning Commission and all partners and sponsors for their support in organizing the FICCI Higher Education Summit 2013 titled “Building Networks for Transforming Indian Higher Education: Enabling to Deliver Value” on November 13 & 14, 2013 in FICCI, New Delhi. We are sure that the deliberations in the conference will help us in coming up with further recommendations to make this vision a reality.

Avinash Vashistha  
Co-Chairman,  
FICCI Higher Education Committee

T.V. Mohandas Pai  
Chairman,  
FICCI Higher Education Committee

Rajan Saxena  
Co-Chairman,  
FICCI Higher Education Committee

Higher Education in India: Vision 2030
Dear readers,

By 2030, India will be amongst the youngest nations in the world. With nearly 140 million people in the college-going age group, one in every four graduates in the world will be a product of the Indian higher education system. By 2030, the already existing challenges for Indian higher education - access, equity and quality - will only be greatly exacerbated unless we significantly transform our higher education model. Needless to say, 2030 calls for a new vision and a new aspiration, and this is the genesis of the “Higher Education in India: Vision 2030” report - to articulate an ambitious vision for higher education reform and lay out a roadmap to achieving it.

As always, a potential danger in advocating for reform is that the discourse of reform often gets mired in correcting for what is wrong than on aspiring for what is right, and in doing so, gets bogged down by the past than focus on the future. The thing is, to move forward, you cannot drive looking in the rear-view mirror, you need to look ahead. In keeping with that, we at FICCI have decided to take a different approach to preparing the Vision 2030 document. Instead of looking back and being guided into the next decade by where we don’t want to be, we decided to look ahead and be guided by where we do want to be.

In 2030, we want to be pioneers of a higher education model that is not just the best in the world, but the best for the world, delivering social, economic and intellectual value par excellence. Accordingly, the report begins with an introduction that takes the reader to 2030 when India is an acknowledged leader in providing large-scale affordable access to high-quality university education and has emerged as a role model for tens of other developing economies, so the reader can see for herself that with an imaginative vision and committed leadership much is possible in a mere two decades. The idea behind describing the future is not to show a pipe dream or build a castle in the air but to confront the reader with what is at stake. We believe this vision is an audacious yet attainable vision for the future, a future we stand to forfeit if we don't act now.

In order to realize the goals we envision for 2030, a transformative and innovative approach would be required across all the levers of higher education: from curricula and pedagogy to the use of technology to partnerships, governance and funding. Making rapid progress over the next two decades would require a committed and concerted effort from all stakeholders involved i.e. academia, industry, and Government.

We hope that this Vision document serves as a clarion call for all stakeholders in India’s higher education system to move beyond the limitations of the present and work towards realizing the very real potential for transformation that the future holds.
Dear readers,

This year's knowledge paper, ‘Higher Education in India: Vision 2030’ on the occasion of the FICCI Higher Education Summit 2013 is a powerful narrative for change in India’s higher education sector. This knowledge paper weaves an aspiring vision for Indian higher education that every Indian would like to see. In the face of a multitude of frictions and tensions that we face, we often get bogged down by issues of here and now. Thus, developing a vision for somewhat distant future and working towards reaching there is a good way to keep on track.

The Twelfth Five Year Plan for higher education provides a good policy foundation for India's higher education future. A lot of work in terms of detailing is needed to move forward.

I am sure Vision 2030 would help us in going through this grind in the times of rapid social, cultural, political and economic changes driven by technological progress, globalization and demographic shifts.

Pawan Agarwal
Honorary Advisor, FICCI Higher Education Committee
Advisor (Higher Education & Culture), Planning Commission, Government of India
Perspective 2030: recounting two decades of transformation in higher education
Over the last two decades, India has remarkably transformed its higher education landscape. It has created widespread access to low-cost high-quality university education for students of all levels. With well-planned expansion and a student-centric learning-driven model of education, India has not only bettered its enrolment numbers but has dramatically enhanced its learning outcomes. A differentiated three-tiered university system – where each tier has a distinct strategic objective – has enabled universities to build on their strengths and cater across different categories of educational needs. Further, with the effective use of technology, India has been able to resolve the longstanding tension between excellence and equity. India has also undertaken large-scale reforms to better faculty-student ratios by making teaching an attractive career path, expanding capacity for doctoral students at research universities and delinking educational qualifications from teaching eligibility.

As a result, today, India’s 70 million student population is a force to reckon with. Among them are potential thought leaders - researchers and academics - positioned at the helm of knowledge creation. Among them are entrepreneurs and executives of the future, industry-ready and highly sought after. From among them emerges India’s massive workforce, the engine of its US$13 trillion economy. Our universities today don’t face a shortage of academics ready to be recruited as faculty, just as our industries find adequate talent that can be inducted with minimal on-boarding.

Despite these strides of progress, India’s higher education institutions are not yet the best in the world - India has fewer than 25 universities in the top 200. Yet, India’s post-secondary education system is increasingly recognised as being the best for the world. The promise of excellence and equity has made the Indian higher education system worthy of emulating, certainly in the developing world that faces the same challenges as India did in the decades prior to its higher education reforms, but less obviously in pockets of the developed world which is under tremendous pressure to provide higher education in cost-effective ways.

However, India has emerged as a regional hub of education and attracts global learners from all over the world. Students, faculty and employers now flock to India to learn, teach and recruit as India dons the mantle of a higher education leader and emerges the role model for delivering high-quality education to vast numbers at low cost.

In short, India has gone from a post-secondary education system that was nearly broken to one that is touted to be best-in-class for the 21st century world in less than two decades, and it is worth taking a closer look at how the country made this remarkable transformation.

From 2013 to 2030: the nuts and bolts of transformation

The planned expansion of a differentiated university system

The Indian higher education system has undergone rapid expansion. In less than 20 years, the country has created additional capacity for a mammoth 40 million students. While the scale of this expansion is remarkable in itself, what sets it apart from earlier decades of equally aggressive expansion is a deliberate strategy and an organized design.

India’s higher education system has finally broken free of decades of colonial overhang. In recent years, the country has undertaken massive structural and systemic changes that have started to yield encouraging results. About 15 years ago, India consciously moved to a differentiated academic system with a three-tiered structure comprising highly selective elite research universities at the top, comprehensive universities and specialized institutions in the middle, and an array of highly-accessible and high-quality colleges at the bottom. While the first tier caters exclusively to furthering India’s intellectual capital, the other two focus on delivering economic and social value respectively.

Top-tier research universities are centers of excellence for the creation of new knowledge, set up with the vision to emerge as national and international leaders in research output and intellectual property. They enroll a selective set of talented, research-oriented students to be taught by stellar faculty. Faculty and students at the university attract handsome research grants and exhibit the greatest international diversity. Going beyond traditional scientific and applied research, these universities have phenomenally broadened the scope of India’s research capabilities to new interdisciplinary areas of scholarship that present the greatest opportunity for the creation of new knowledge and hold most relevance for India in the new world. For example, Indian universities are at the forefront of research in bioscience, environment and climate change, inclusive development and leadership. Leveraging their cost and competitive advantage, Indian research universities have pioneered the model of blended research where they collaboratively produce cutting-edge research with other top-rung universities around the world. Further, despite directly educating only a small group of elite students, these universities have emerged as the indirect wellspring of content and curriculum for millions of other students who have seamless access to high-quality content from these universities through the Massive Open Online Courses (MOOCs) model.

The second tier of industry-aligned professional education institutions has seen the greatest growth over the last two decades. Focused on quality teaching and producing highly employable graduates, these institutions are a passport to white-collar jobs in a knowledge economy. They impart knowledge and technical know-how on the one hand and broad-based critical thinking and problem-solving skills on the other to produce well-rounded industry leaders. Student learning outcomes are centre stage to this model. The ‘liberal’ component in this model of education is designed to correct for traditionally strict disciplinary boundaries, rigid departmental silos and narrow specialisations once characteristic of Indian higher education. In effect, when a civil engineer educated thus sets out to build a bridge he would not only approach it from an engineering angle, but would also assess the environmental impact of building the bridge, the socio-economic impact of improved infrastructure, the financing of the bridge and possibly all the related regulatory hurdles to be overcome to get the plans approved. The curricular focus in these institutions is on content delivery rather than on content creation, where faculty borrow from the best open courseware and customise it to the needs of their students. While a section of the faculty are academic researchers, these universities also draw faculty from experienced practitioners and industry professionals who are subject matter experts and can act as mentors to students in the early stages of their professional careers.
The last cluster of broad-based highly-accessible universities is designed to expand the reach of higher education to all eligible and deserving students in the country. They offer a wide range of courses aimed at providing a holistic education to India's masses, and play a major role in promoting equity and access. Their distinguishing characteristic is a varied student population with significant regional and linguistic diversity and a balanced gender profile. They rely heavily on online methods of teaching and learning, enroll a sizeable number of mature students and offer both part-time and full-time options.

The differentiated system offers students a wider variety of unique and quality programs at both graduate and undergraduate levels. It clarifies student choices and effectively caters to a heterogeneous student population with varying needs and demands, while also providing them the option for inter-institution mobility through system wide credit transfer. In this way, while planned expansion has helped create capacity for ever-increasing numbers, the differentiated system has been instrumental in directing these numbers to the right stream and the appropriate kind of institution in order to effectively meet the needs of Indian society.

Lastly, planned expansion has also helped solve for the problem of infrastructure and resources. Riding the wave of urban planning, India earmarked tracts of land in many tier-II cities to create ‘education cities’ which have today emerged to be thriving inner-city university campuses tightly integrated with their host cities. Unlike the erstwhile ideal of a mono-functional and isolated greenfield campus removed from the city, providing academics and students the distance to reflect on humanity, these campuses are located in the heart of the city, with several universities collocating on a single campus. They share a close relationship with the host city and are embedded in ‘knowledge ecosystems’ enabling them to perform better.
From 2013 to 2030: the nuts and bolts of transformation

The transition to a learner-centered paradigm of education

An Indian student in 2013 was a ‘passive player’ on a predefined education pathway. She had little choice in what she learnt and little say in how she learnt it. The curriculum was predesigned and worse still, outdated and seldom relevant, and the dominant mode of instruction was information-loaded, one-way lectures from the teacher to the student. If one were to describe the transformation in higher education pedagogy from then to now, dramatic would be an understatement. In today’s classrooms, the student is an active participant in the education process and the role of a professor is that of a facilitator as opposed to an instructor. The instruction is designed to engage students in learning experiences that not only enable them to learn content but also to develop greater passion for learning – enabling them to ‘learn to learn’ and to be lifelong learners.

In the learner-centred paradigm of education, students are encouraged to take greater responsibility for their learning outcomes. The professor ceases to be the fount of knowledge filling the empty receptacles of students’ minds; instead, students actively participate in the discovery of knowledge. They are encouraged to be reflexive and thoughtful learners, learning from themselves, their peers and their immediate environment just as much as they would from their professors. Accordingly, the teaching-learning methodology involves less lecturing and rote note-taking and more hands-on activities to allow for experiential and interactive learning.

Over the years, such emphasis on learning has impacted students and learning outcomes in ways that have far-reaching impact for Indian economy and society. Firstly, by stoking students’ innate curiosity and encouraging them to learn in self-directed ways, it has enabled Indian graduates to be independent, critical thinkers. As a result, it has greatly enhanced the country’s innovation capability and entrepreneurial ambition, positioning it amongst the most attractive R&D hubs for dozens of multinationals. Secondly, the learner-centered paradigm has helped India’s thriving human resource base to keep pace with the changing needs of their work environments. Over the years, with evolution of the ‘knowledge economy’, learning and work have become inseparable, making constant on-the-job learning and up-gradation indispensable. Trained to be active and adaptive lifelong learners, the Indian workforce is known to be dynamic and agile even in the face of ‘disruptive’ progress.

Lastly, but importantly, the learner-centered approach has helped correct for the problem of equity in Indian higher education. As India’s enrolment numbers grow, and access to higher education expands, the learner-oriented method has helped sensitize educators to difference in learning styles and student expectations that result from diversity in student backgrounds. By placing the student at the centre of the learning process, the approach on the one hand has enabled institutions to devise new and innovative ways to reach diverse learners, and on the other, helped students discover and exercise their distinctive learning styles to chart an educational pathway that is personally meaningful and relevant.
From 2013 to 2030: the nuts and bolts of transformation

Intensive use of technology

The Indian higher education system has undergone massive expansion to become the largest in the world enrolling over 70 million students. Such expansion would have been unimaginable without the extensive use of ICT tools. To illustrate, if India were to create this additional capacity through increase in brick and mortar institutions alone, it would have had to build six universities and 270 colleges each and every month in the last 20 years – a feat that would have been impossible to achieve with India’s limited resources. Instead, India chose to go the MOOCs way.

Online platforms and ICT tools have helped take higher education to millions of deserving students in far-flung areas who would otherwise have no access to university education. Online education has become the first port of call for many students who were earlier left out of the higher education system, or had to settle for lower quality alternatives. The MOOCs model made it possible for the country to provide a quality education to the masses despite poor faculty-student ratios. Students today increasingly learn from leading faculty at elite institutions beyond the four walls of their classrooms as top-tier institutions have donned the mantle of being content generators. Professors collaborate across universities to collectively create and distribute for-credit curriculum for an online semester.

Technology has not only been instrumental in addressing the demand-supply gap for quality education, but has fundamentally changed the nature of several educational processes. Gone are the days when students had to gather in a large hall only to hear a lecture. Today, classroom lectures and pre-recorded and uploaded to be accessed by students at their comfort. Class time is instead used for creating more in-depth learning experiences through group activities, problem solving and interactive learning. Online analytics provide faculty with data on how and at what pace each student is learning, enabling them to provide personalized support to aid student learning outcomes. The model also acts as a great democratize, allowing students to learn at their own pace – for instance, slow learners can go over certain content and exercises multiple times with special tools to aid their learning. Finally, the hybrid model (where part of the program is taught online and part in person) has become particularly popular among adult and working professionals looking to gain additional credentials. The model provides them with the flexibility to access course material as their schedule permits.

In short, technology has been nothing short of disruptive for Indian higher education, solving for three of India’s pressing problems - access, equity and quality - at once.
From 2013 to 2030: the nuts and bolts of transformation

The imperative of the previous decade towards ‘good governance’ in all realms – business, administration and politics – has resulted in dramatic changes in the governance framework for higher education in areas both internal to institutions (their management and leadership structures) as well as areas external to institutions (the regulatory framework). While much has been done towards ensuring quality, instituting accountability, enabling private participation, promoting internationalization and so on, there are five salient trends that deserve particular mention when talking of governance reforms since 2013 –

- **Diminishing role of government in governance**: Over the years, the government has gradually withdrawn from direct management of public institutions, devolving governance to boards compromising academics, alumni and external members. Instead, it exerts indirect forms of control based largely on mechanisms such as performance-linked funding and quality recognition. The erstwhile regulatory regime of multiple bodies with conflicting and overlapping mandates has given way to a single independent regulator that is largely hands-off, with the regulatory focus shifting from ‘high barriers to entry’ to ‘high standards for accreditation’. Self-regulation and self-critique has now become the norm. The government’s role as a provider of funding has also seen some shifts. Over the 13th and 14th plan periods, the funding model has moved from funding for institutions to funding for individuals (including faculty, students and researchers). As a result, institutions can no longer rely solely on government monies for operations and expansion, but are increasingly taking greater responsibility for sourcing funding, further increasing their autonomy to plan their own futures.

- **Moving from monitoring inputs to regulating outcomes**: Traditionally, regulatory bodies in Indian higher education have been focused on monitoring inputs. Universities were assessed on the size of built-up land, number of books in their library, funds spent on computers and so on instead of on student learning outcomes, their employment readiness or performance in standardized tests. A conscious effort to reverse this anomaly has been made over the years by linking public funding with performance variables. Attempt has also been made to shift the thrust from consumption of allocated funds to outcomes from utilized funds, effecting, at the same time, greater autonomy in the use of allocated funds as well as greater institutional responsibility towards their effective utilization.

- **Compulsory accreditation**: The move towards regulating outcomes has been accompanied by the introduction of a more sophisticated quality assurance system based on the establishment of a national accreditation agency for higher education and also several other agencies with a specialized focus. As a result, claims to quality can no longer be based on internal judgment by institutions themselves but have to be justified by an external process of peer review and assessment by quality rating agencies. While the model has been in practice for many years before India adopted it, what is rather distinctive about the Indian accreditation system is that each tier of universities has a different rating scale, allowing stakeholders to make comparisons across like variables. Periodic assessment and review allows institutions to move up or down the hierarchy of grades within their tier, or even move across tiers. Further, in order to prevent an oligopolistic scenario from building inadvertently, the accreditation system allows fledgling institutions to grow and find a foothold before subjecting them to extensive scrutiny.

- **Enabling environment for private and foreign participation**: About ten years ago, the distinction between ‘private’ and ‘public’ among universities had effectually started to blur, with recommendations from the Narayana Murthy Committee Report being a first step in this direction. Thanks to lower barriers to entry and the evolution of a mandatory accreditation system, quality benchmarks have become the sole basis of differentiation among universities within a certain tier. Today, foreign education providers are also treated on par with Indian institutions, they too being subjected to the same accreditation norms.

- **Thrust towards internationalization**: Lastly, much of the 20 years of reform – including in aspects of governance – was underpinned by the desire and commitment to emerge as a globally competitive education system. Internationalization has been a powerful driving theme, enabling the Indian higher education sector to both be in consonance with global standards as also emerge a leader in higher education globally. India’s higher education institutions are today global in all senses of the word, not least of which is leadership. Today, institutional leaders are selected in an open and competitive process, and as many as 100 of our universities are led by international academics and administrators, a trend that could perhaps be traced back to the appointment of Dr. Ashish Nanda of Harvard Law School as Director of Indian Institute of Management, Ahmedabad – a first of its kind appointment in its day.
In conclusion...

India seems to have indeed entered a golden age for higher education. Many progressive steps taken in 12th, 13th and 14th Five Year Plans have come to fruition. The country has emerged to be a global magnet for aspiring learners, and a role model for high-quality affordable educational systems.

Today,

- India is the **single largest provider** of global talent, with one in four graduates in the world being a product of the Indian system.
- India is among **top 5 countries globally** in cited research output, its research capabilities boosted by annual R&D spends totaling over US$140 billion.
- India is in the **fourth cycle of its research excellence framework**, with at least a 100 of Indian universities competing with the global best.
- **23 Indian universities** are among the **global top 200**, going from none two decades ago.
- In the last 20 years alone, **6 Indian intellectuals** have been awarded the **Nobel Prize** across categories.
- India is a **regional hub for higher education**, attracting global learners from all over the world.
- The country has augmented its **GER to 50%** while also reducing disparity in GER across states to 5 percentage points.
- The Indian higher education system is **needs-blind**, with all eligible students receiving financial aid. **Two-thirds of all government spending** towards higher education is spent on individuals, including faculty and students.
- India’s massive open online courses, started by several elite research universities, collectively enroll **60% of the world’s entire student population**.
- Indian higher education institutions are governed by the highest standards of ethics and accountability, with every single one of them being peer-reviewed and accredited.

To sum up, the three tiers of Indian universities produce among the best-in-class knowledge creators, problem solvers and process managers, who also display deep social, cultural and ecological sensitivity, are collaborative leaders and responsible citizens. In effect, the Indian graduate of today is not only an excellent human resource but also an admirable human being. Even as India deserves to fully revel in its resounding success of the last two decades, it must remember that to maintain its position of leadership in higher education, the next twenty years call for just as much leadership, vision and commitment as did the last twenty, and a golden vision 2050 should be India’s next aspiration!
Vision 2030: towards a brave new world of higher education
India will have the largest population in the world, in the higher education age bracket by 2030; increasing urbanization and income levels will drive demand for higher education.

India is expected to become the most populous country by 2030

Its population, aged between 18-23 years is expected to reach 142 million by 2030, accounting for 10% of the total population

India’s urban population is expected to grow faster than its overall population and is estimated to account for 41% of total population by 2030

India’s real GDP per capita is expected to grow at a CAGR of 5.9%, higher than emerging markets’ average of 5.4% and global average of 4%

India’s economy is expected to grow at a fast pace; industry and services sectors will further dominate the economy.

India is expected to be the fastest growing economy in the world over the next 15-20 years. Industry and services sectors are expected to contribute ~92% of India’s GDP by 2030.

Real GDP in 2030 (in US$ billion at 2005 PPP)

<table>
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<tr>
<th>Country</th>
<th>Real GDP in 2030</th>
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<tbody>
<tr>
<td>China</td>
<td>34,732</td>
</tr>
<tr>
<td>US</td>
<td>22,234</td>
</tr>
<tr>
<td>India</td>
<td>13,420</td>
</tr>
<tr>
<td>Japan</td>
<td>4,860</td>
</tr>
<tr>
<td>Brazil</td>
<td>3,955</td>
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Growth rate (FY12-30)

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<tr>
<th>Country</th>
<th>Growth Rate (FY12-30)</th>
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<tbody>
<tr>
<td>China</td>
<td>6.6%</td>
</tr>
<tr>
<td>US</td>
<td>2.5%</td>
</tr>
<tr>
<td>India</td>
<td>6.7%</td>
</tr>
<tr>
<td>Japan</td>
<td>1.1%</td>
</tr>
<tr>
<td>Brazil</td>
<td>3.9%</td>
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Industry and services sectors are expected to contribute ~92% of India’s GDP by 2030.

GDP: share estimates by sector (percentage)

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<thead>
<tr>
<th>Sector</th>
<th>FY10</th>
<th>FY30</th>
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<tbody>
<tr>
<td>Agriculture</td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td>Industry</td>
<td>28%</td>
<td>24%</td>
</tr>
<tr>
<td>Services</td>
<td>57%</td>
<td>68%</td>
</tr>
</tbody>
</table>

Source: IHS Global Insight 2013, EY estimates
Industry and services sectors in India would require a gross incremental workforce of ~250 million by 2030; India could potentially emerge as a global supplier of skilled manpower.

While the net incremental workforce required in the industry and services sectors is ~145 million, the gross incremental manpower needed is estimated at ~250 million given retirements / drop outs.

A significant proportion of this incremental requirement will need to be serviced by the higher education system.

With a median age of 32 years in 2030...

...India will have a labor surplus; India could, therefore, become a large supplier of skilled manpower to labor deficient markets around the world.

Further, India has the opportunity to become a prominent R&D destination

**R&D spending in India has the potential to increase from US$32.7 billion in 2010 to US$140 billion in 2030, if its expenditure on R&D as a share of its GDP were to reach 2.5% (similar to the current share of countries such as the UK, France, and Australia)**

<table>
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<tr>
<th>Indian companies are spending increasing amounts on R&amp;D</th>
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<tr>
<td>➤ Top Indian companies have reported the largest growth in R&amp;D investment in FY12 (with a 35% y-o-y growth); this compares with China’s 28.8%, the EU’s 8.9% and the US’ 9%</td>
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<table>
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<tr>
<th>Global companies are setting up R&amp;D facilities in India</th>
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<tr>
<td>➤ World class R&amp;D facilities are being set up for several industries in India, including chemicals, automobiles, life sciences, electronics, and technology</td>
</tr>
<tr>
<td>➤ Between 2011 and 2013, more than 100 companies including Panasonic, Airbus Innovation, BASF, Pfizer, Facebook and LinkedIn, have opened their R&amp;D centres in the country</td>
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<tr>
<th>The Government is implementing initiatives to boost R&amp;D in the country</th>
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<tr>
<td>➤ The Union Ministry of Science and Technology and RIKEN, Japan’s largest research organization, have signed a Memorandum of Understanding (MoU) to launch joint research programs in the fields of biology, life sciences and material sciences, and genome-related research including systems biology and computational science</td>
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<tr>
<td>➤ Phase 2 of UK-India research programs has been launched. This includes establishment of the new Chemical Biology and Therapeutics Institute in the country, major collaborations on neuroscience and research partnerships in the fields of energy, medicine, business and manufacturing</td>
</tr>
<tr>
<td>➤ <strong>Kishore Vaigyanik Protsahan Yojana (KVPY):</strong></td>
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<tr>
<td>➤ National Program of Fellowships in Basic Sciences, initiated and funded by the Department of Science and Technology, Government of India</td>
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<tr>
<td>➤ Aims to attract interested students at an early stage (those studying in Class XI onwards to first year undergraduates taking basic science courses) to pursue research-based careers in science</td>
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<tr>
<td>➤ Generous scholarships provided to selected students - INR5,000 per month for undergraduate fellows and INR7,000 per month for postgraduate fellows</td>
</tr>
<tr>
<td>➤ <strong>Innovation in Science Pursuit for Inspired Research (INSPIRE):</strong></td>
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<tr>
<td>➤ Flagship scheme of the Department of Science and Technology, Government of India, to promote careers in scientific research among students</td>
</tr>
<tr>
<td>➤ Supports more than 800,000 awards (for age group of 10-15 years), ~ 150,000 internships (for age group of 16-17 years), 28,000 scholarships for undergraduate studies in the sciences (for age group of 17-22 years), 2,150 research fellowships for doctoral research and 270 faculty awards for post doctoral researchers</td>
</tr>
<tr>
<td>➤ Signed partnerships with 29 school boards to attract youth to study science courses at undergraduate and postgraduate levels</td>
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Given the expected socio-economic scenario in 2030, India would need a robust higher education system that can deliver on multiple imperatives.

### Vision statement: Indian higher education

To build a 21st century model for higher education that is of high-quality, yet equitable and affordable, and makes India a role-model for a higher education system that is not just the best in the world but the best for the world.

### India in 2030: socio-economic context

#### Demographic
- 142 million students in the higher education age group (18-23 years)
- Increasing income levels and urbanization

#### Economic
- Third-largest economy in the world
- 250 million gross incremental manpower required across industry and services sectors
- Potential supplier of skilled manpower to labor-deficient markets, given median age of 32 years and a large projected labor surplus
- Potential to become a prominent R&D destination

### Imperatives for India’s higher education system

#### Social imperatives
- Creating additional capacity of 40 million to serve the incremental demand for higher education (to achieve a GER of 50%)
- Providing affordable access to disadvantaged / low income segments
- Achieving reduced disparity in GER across geographies, and economic and social groups
- Generating greater awareness leading to improved human development and social indicators (life expectancy, health, sanitation, law and order)

#### Economic imperatives
- Developing a skilled, job-ready and productive workforce by imparting technical and soft skills training
- Imparting education / skills that enable students to become entrepreneurs
- Enabling higher education graduates with global skills, who can be employed by workforce-deficient countries
- Enabling development of successful economic models at the grass-root (district/block) level through community engagement

#### Intellectual imperatives
- Developing research-focused universities that deliver high quality research output and research-focused graduates
- Developing India as a destination for higher education for students, faculty, researchers and employers from all over the world
A differentiated system of institutions with differing objectives and focus areas would be critical for achieving the proposed goals.

Research-focused institutions

- High-quality institutions with research and innovation as the prime focus
- Critical role in addressing intellectual imperatives

Career-focused institutions

- Institutions offering technical/professional courses, with a focus on producing industry-ready graduates
- Critical role in addressing economic imperatives

Foundation institutions

- Institutions offering a wide range of courses aimed at providing a well-rounded and holistic education to India’s masses
- Imparting skills that are relevant to the local industry/community
- Critical role in addressing social imperatives

These different types of institutions would require fundamentally different architectural and foundation elements, which have been described on subsequent pages.
## Overview

- To be centers of research excellence; amongst the best research institutions in the world
- To act as centers of innovation and creation of knowledge
- To attract academically brilliant students and stellar faculty from all over the world, and be valuable assets in India’s knowledge-driven economy

## Characteristics

- Research-integrated curricula
- Research-based alliances/partnerships with other research institutions, government bodies and foundations
- Strong research infrastructure funded by government or corporate-led foundations
- Significant income earned from research projects
- High international diversity in composition of students and faculty members

## Outcomes for various stakeholders

### Students and Alumni

- Academic leaders and thinkers, knowledge creators
- International recognition and diversity in composition of students

### Industry

- Leaders in research-related output and intellectual property, enabling leapfrog innovations in industry
- High-quality applied research for Indian as well as international corporations

### Government

- High-quality research relating to public policy and governance
- Knowledge creation in areas that serve the long-term strategic interests of the country
- Ranking among the top 5 in the world terms of number of PhD degree holders

### Indian society

- Research output that holds most relevance for India in the new world
- Focus on unique knowledge requirements specific to Indian society

### International Community

- Strong contribution towards the global knowledge pool
- Ranking among the top 5 in terms of research papers and citations
- Ranking among the top 200 in the world
- 5-6 Nobel laureates across categories
## Research-focused institutions

### The building blocks

<table>
<thead>
<tr>
<th>Architecture</th>
<th>Curricula</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students</strong></td>
<td>▶ Integrated research activity and curriculum</td>
</tr>
<tr>
<td>▶ Talented and research-oriented individuals</td>
<td>▶ Postgraduate level: 40% weightage to research</td>
</tr>
<tr>
<td>▶ Increased proportion of postgraduate/doctoral students as compared to undergraduate students</td>
<td>▶ Undergraduate level: 20% weightage to research</td>
</tr>
<tr>
<td>▶ Enhanced international diversity</td>
<td>▶ Multi-disciplinary course structure</td>
</tr>
<tr>
<td>▶ Top 10% of total enrolment</td>
<td>▶ Content and curriculum that can be accessed through Massive Open Online Courses (MOOCs) by millions of students from other universities in India and from around the world</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty</th>
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</thead>
<tbody>
<tr>
<td>▶ High proportion of full time faculty (75%-80%)</td>
<td></td>
</tr>
<tr>
<td>▶ 90%-100% of faculty with PhD degrees</td>
<td></td>
</tr>
<tr>
<td>▶ Faculty students ratio of 1:10</td>
<td></td>
</tr>
<tr>
<td>▶ Stellar, highly qualified faculty that is able to attract handsome research grants</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure</th>
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<tbody>
<tr>
<td>▶ Campus spread over large land parcel with state-of-the-art infrastructure for teaching and research</td>
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<tr>
<td>▶ Labs and other facilities to support cutting edge research activity</td>
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<table>
<thead>
<tr>
<th>Partnerships</th>
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</thead>
<tbody>
<tr>
<td>▶ Collaborations with global institutions to conduct collaborative research and organize student and faculty exchange programs, joint lectures and seminars</td>
<td></td>
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<tr>
<td>▶ Collaborations with corporations to conduct industry-relevant research</td>
<td></td>
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<tr>
<td>▶ Collaborations with the community to ultimately advance goals of relevance to humanity</td>
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<table>
<thead>
<tr>
<th>Research focus</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>▶ Ranking among the top 200 universities in terms of global rankings</td>
<td></td>
</tr>
<tr>
<td>▶ Strong research capabilities in areas relevant to India. E.g. bioscience, environment and climate change, inclusive development and leadership</td>
<td></td>
</tr>
<tr>
<td>▶ Healthy mix of industry oriented and academic research</td>
<td></td>
</tr>
<tr>
<td>▶ Inter-disciplinary areas of scholarship</td>
<td></td>
</tr>
<tr>
<td>▶ High involvement of both students and faculty in research activity</td>
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</tbody>
</table>

<table>
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<tr>
<th>Funding</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Financial support from Government for research</td>
<td></td>
</tr>
<tr>
<td>▶ Endowments from industry</td>
<td></td>
</tr>
<tr>
<td>▶ Strong alumni networks</td>
<td></td>
</tr>
<tr>
<td>▶ Industry-sponsored research/live projects</td>
<td></td>
</tr>
</tbody>
</table>
Overview

To focus on student learning outcomes
To offer industry-aligned courses that produce industry-ready graduates for a wide range of white collar jobs

Characteristics

Oriented to produce graduates to meet the needs of Indian economy
Re-evaluation of course mix, curriculum and pedagogy with the evolving needs of the economy to stay relevant
Focus on producing graduates who are “ready to hire” by embedding skill-related training in their curricula Key skills imparted:
- Functional skills that are core to the profession/industry of the students’ course
- Critical thinking skills and problem solving skills to produce well rounded leaders
- Soft-skills such as written and verbal communication
- Focus on developing entrepreneurial skills to encourage people to take up entrepreneurship

Outcomes for various stakeholders

Students and alumni
- Enhanced employability of graduates across white collar jobs
- Development of future industry leaders and professionals
- Continuous professional development of alumni through regular engagement

Industry
- Benefit to India’s growing knowledge economy by producing industry-ready talent with the necessary skills

Government
- Reduction in unemployability as a result of delivering industry-oriented education to a large section of the 18-23 year old population

Indian society
- Increased employability leading to augmented productivity and income levels, resulting in multiple social benefits including a raised standard of living

International community
- Supply of highly employable talent to the international markets, which are expected to face acute shortage of workforce by 2030
## Career-focused institutions

### The building blocks

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<th>Architecture</th>
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<tbody>
<tr>
<td><strong>Students</strong></td>
<td>Focus on imparting knowledge and technical know-how and delivering content, rather than generating content / knowhow</td>
</tr>
<tr>
<td>▶ Focus on enrolling students with a strong aptitude in their chosen fields</td>
<td>▶ Courses that are in sync with market requirements</td>
</tr>
<tr>
<td>▶ Higher proportion of undergraduate enrolment</td>
<td>▶ Curriculum designed in consultation with industry practitioners</td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td>▶ Combination of theory and practical methods in pedagogy</td>
</tr>
<tr>
<td>▶ 80% faculty with industry experience</td>
<td>▶ Mandatory internship before the final year</td>
</tr>
<tr>
<td>▶ Average industry experience of 7-10 years</td>
<td>▶ Pedagogy that focuses on developing critical thinking, problem solving and communication skills, while emphasizing student learning outcomes</td>
</tr>
<tr>
<td>▶ Faculty student ratio – 1:15</td>
<td>▶ Entrepreneurship training to build future leaders</td>
</tr>
<tr>
<td>▶ Higher proportion of visiting/contractual faculty</td>
<td>▶ “Liberal arts approach” to education to create well-rounded individuals</td>
</tr>
<tr>
<td>▶ Faculty would act as mentors to students guiding them on their careers in the industry</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Research focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Technology-intensive infrastructure</td>
<td>▶ Mainly applied/industry-oriented research</td>
</tr>
<tr>
<td>▶ Use of ICT tools in pedagogy</td>
<td>▶ Adapt content from industry</td>
</tr>
<tr>
<td>▶ Mix of face-to-face and online delivery of content</td>
<td>▶ Live projects funded, supported and mentored by the industry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partnerships</th>
<th>Foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Industry’s involvement in development of curricula, guest lectures, mentoring, live projects and industry tours</td>
<td>Governance</td>
</tr>
<tr>
<td>▶ Partnerships with Tier-1 and 2 international institutions to provide global exposure</td>
<td>▶ Autonomy in content design and faculty recruitment</td>
</tr>
<tr>
<td></td>
<td>▶ Governing body comprising mix of academics and industry leaders</td>
</tr>
<tr>
<td></td>
<td>▶ Self-enforced regulation</td>
</tr>
<tr>
<td></td>
<td>▶ Disclosure of all institute-related data and its regular updating</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ Private philanthropic endowments</td>
</tr>
<tr>
<td>▶ Alumni networks</td>
</tr>
<tr>
<td>▶ Government aid for scholarships</td>
</tr>
</tbody>
</table>
Foundation institutions
Characteristics and outcomes

**Overview**

- To offer a wide range of basic undergraduate and postgraduate courses to provide basic college education to a large number of individuals
- To focus on achieving social objectives of alleviating poverty and creating awareness of and improving health, sanitation, law and order
- To impart skill-based training to enable employability at grassroots and thereby serve economic needs

**Characteristics**

- Offer wide variety of programs/courses across all levels (undergraduate/postgraduate/doctoral) in the humanities, pure sciences, social sciences, engineering, and management domains
- Focus on imparting broad-based and holistic education to produce well-balanced individuals who are morally and socially conscious and have a sound basic education that enables them to charter a path to their chosen careers
- Focus on development of critical thinking skills / application-oriented teaching
- Have relatively low course fees and focus on reaching a large percentage of India’s population
- Utilize online methods of teaching and learning to cater to a large population base
- Tie-ups with ITIs, polytechnics and other vocational training providers to impart skill-based training

**Outcomes for various stakeholders**

**Students and alumni**

- Holistic education to a large student base at an affordable price
- Enhanced employability through technical and soft skills training
- Continuing education for mature students

**Industry**

- Easily accessible, large pool of productive and aware workforce to support strong and inclusive growth
- Improved social order to ensure favorable environment for industrial growth

**Government**

- Increased overall GER in higher education (50% by 2030)

**Indian society**

- Increased access to employment and a more equitable society
- Improved social indicators with a more aware and socially-conscious population

**International community**

- Serve as an example of the largest, high-quality education system for the rest of the emerging world by 2030
## Foundation institutions
### The building blocks

### Architecture

#### Students
- Eligible and deserving students with significant regional and linguistic diversity and a balanced gender profile
- Higher proportion of postgraduate students (vis-à-vis current mix)
- Sizeable number of mature students
- Account for 50%-60% of the total higher education enrollment

#### Faculty
- 10-20% faculty with PhDs; 80-90% faculty with a Masters degree
- Faculty student ratio - 1:15-20

#### Infrastructure
- Functional campus, meeting all basic requirements
- Adequate number of books, journals and computers
- Mix of online and face-to-face delivery of content
- Widespread online network to reach out to the large student base
- Peer-to-peer learning technology

#### Curricula
- Ensure minimum quality standards
- Offer a wide range of full-time and part-time programs to provide a holistic education
- Provide vocational training modules/courses through tie-ups with ITIs, polytechnics and other vocational training players
- Provide entrepreneurship-related courses/training to build future leaders
- Focus on languages, social sciences, health, sanitation, etc.

#### Research focus
- Focus on basic community/development based research customized to the needs and requirements of the local communities

#### Partnerships
- Partnerships with leading Indian institutions for distance learning programs and content
- Partnerships with industry for industry visits, conferences, and guest lectures
- Partnerships with ITIs, polytechnics and other vocational training providers for skills training

### Governance
- Mix of academics and administrators
- Independent with autonomy in development and assessment of courses
- Self-enforced regulation
- Disclosure of all higher education related data and its regular updating

### Funding
- Substantial government funding for infrastructure and scholarships
- Government/Industrial funding for community-based research
### What will India look like in 2030 from a demographic and economic perspective?

**Demographic context**
- India will have the largest population in the higher education age bracket in the world
- Increasing income levels will spur the demand for higher education

**Economic context**
- More than 250 million additional skilled manpower will be required across the industry and services segments by 2030; additionally, this could also serve international markets that are expected to be labor-deficient
- India has the opportunity to become a prominent R&D destination, especially in certain industries where it has strong capabilities

### Given this context, what should be India’s higher education imperatives?

<table>
<thead>
<tr>
<th>Social</th>
<th>Economic</th>
<th>Intellectual</th>
</tr>
</thead>
</table>
| ► Additional capacity of 40 million to serve the incremental demand for higher education  
► Affordable access to higher education for disadvantaged/low income segments  
► Reduced disparity in GER across geographic, economic and social groups  
► Improved social indicators | ► Churning out employable manpower to meet the increasing demands of industry  
► Production of well-rounded industry leaders  
► Export of skilled manpower to labor deficient global markets | ► High-quality research output and research-focused graduates  
► Development of India as a destination for higher education for students, faculty, researchers, and employers from around the world |

### What type of institutions will be required to achieve these goals?

<table>
<thead>
<tr>
<th>Foundation institutions</th>
<th>Career-focused institutions</th>
<th>Research-focused institutions</th>
</tr>
</thead>
</table>
| ► Access to affordable education to eligible and deserving students  
► Major role in promoting equity and access  
► Wide range of courses  
► Holistic education to masses  
► Providing skill-based and entrepreneurship training | ► Focus on critical thinking and problem solving skills  
► Industry-aligned courses  
► Entrepreneurship training  
► Faculty with industry experience  
► Strong industry linkages across the education value chain | ► Centers of excellence for knowledge creation  
► High focus on research delivered by stellar faculty  
► Inter-disciplinary areas of scholarship  
► State-of-the-art infrastructure  
► High-quality collaborations for cutting-edge research |
Journey 2030: the road to realise the vision
To achieve the envisioned state in 2030, transformational and innovative interventions would be required across all levers of the higher education system.
1. Curricula and pedagogy

Adopt a learner-centered paradigm of education

Key action steps

► Develop content, pedagogy, and assessment systems that support experiential, interactive, and student-centered learning
► Revamp the existing structure of teaching in higher education institutions to cater to the diverse choices and learning styles of students
► Train faculty in being good facilitators

Impact

► Effective and customized learning
► Pool of reflexive and thoughtful learners
► Graduates with independent and critical thinking skills
► Increased innovation capability and entrepreneurship in the country
► Evolution of a workforce that can readily adapt to the dynamic work environment

Primary target

1. Research focused institutions
2. Career-focused institutions
3. Foundation institutions
1. Curricula and pedagogy
Introduce liberal arts approach and multi-disciplinary courses for students to get a holistic exposure

Adopt a liberal arts and experiential approach to education, equipping students with the skills needed to adapt to changing environments

- Encourage a liberal arts approach to education that focuses on development of:
  - Critical thinking skills
  - Communication and creativity-related skills
  - Conceptualization and problem-solving skills
- The ‘case study’ method of teaching can be adopted to develop problem solving and critical thinking skills
- Instil in students the ability to apply knowledge and skills in real-world settings by:
  - Adopting a project-based approach to enable practical application of concepts learnt in the classroom
  - Integrating industry internships into the curricula
  - Focusing on co-curricular activities to develop leadership and team-building skills

Higher education in China: adopting a liberal arts education approach

- In 2012, Hong Kong’s universities transitioned from three-year Baccalaureate to four-year programs to make room for additional general education beyond a given major
- Keeping in view the liberal arts education approach, there have been curricula-related reforms in leading universities in mainland China, including in Peking University, Zhejiang University and Wuhan University. Shanghai Jiao Tong University and Tsing Hua University have also announced a number of such initiatives

Introduce multi-disciplinary courses to enable students to get broader exposure and develop a holistic worldview

- Provide exposure to multiple subjects to get multi-faceted exposure across a variety of topics relating to the political, economic and social environment
- Provide flexibility to students to change their subjects during their graduation courses
- Offer a wide range of options/add-ons to ensure intellectual development in addition to a student’s core subject
- Implement a choice-based credit system that replaces the standard curriculum-based one

Multi-disciplinary approach in a newly established university in India

<table>
<thead>
<tr>
<th>Total credits for graduation</th>
<th>80% credits for major and minor subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>20% credits for common core subjects</td>
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</tbody>
</table>

- All undergraduate students have to choose from a core group of common subjects related to history, communication, culture, environment and society
- This is to provide them with an understanding of the forces that drive local, national, and global dynamics
- The university provides the option of switching the major subject(s) during the course

Key action steps

- Develop content/pedagogy in accordance with requirements to impart the skills mentioned above
- Revise of existing evaluation (exam-oriented approach) system to make room for adoption of new teaching techniques
- Tie-ups/Partnerships with industry players for internships
- Train faculty members to enable them to deliver the revised curricula / pedagogy

Source: Website of a new established Indian University, University of Twente report 2013: Building World Class Universities
1. Curricula and pedagogy
Introduce ‘industry-oriented’ courses and skill-based training to enable enhanced employability

Launch specialized courses to cater to the need for trained manpower in “industries of the future”

- Several emerging industries such as biotech, life sciences and clean tech will need specialized skills
- Courses focused on these emerging industries, therefore, need to be introduced to cater to the additional requirement for manpower in these industries

Some examples of industry specific courses across universities in India and abroad
- DeVry University: course on the computer gaming industry
- Queens University, UK: course on agricultural technology
- Amity University: course on solar energy

Key action steps
- Develop content/pedagogy for courses related to emerging industries through academia-industry collaborations
- Hire faculty with relevant qualifications and industry experience, and train them to ensure effective delivery of curricula

Introduce basic skill-based courses and enable flexibility/multiple points to enter and exit the higher education system

- North American model of community colleges:
  - Modular credit-based course with flexibility of entry and exit
  - Certificates (one year)/Diplomas (two years) with the options to transfer to regular degree programs
  - Curricula: a mix of academic and vocational skills
  - The National Vocational Qualification Framework (NVQF), implemented in several countries, has proved more successful in those such as Scotland and Tunisia, where it was integrated with their existing higher education systems.
  - India is looking at implementing the Community College concept that conforms with the National Skills Qualifications Framework (NSQF)

Key action steps
- Introduce changes in the regulatory framework to enable a system of flexible entry and exit in the higher education system
- Develop content/pedagogy in accordance with the requirements of the proposed system
- Undertake measures for ‘on-boarding’ of industry to the new system, and ensure the participation of the industry to provide employment to those opting to exit the system before completing their degree course

Source: Websites of DeVry University, Queens University, Amity University; American Association of Community Colleges; ILO report on NQF 2010
1. Curricula and pedagogy
Introduce courses in entrepreneurship and social sciences for economic and social development

Develop entrepreneurial ecosystems in institutions

- Offer courses on entrepreneurship and self-employment to impart relevant skills to create entrepreneurs and develop future business leaders for the country
- Encourage the entrepreneurial spirit amongst students by supporting students during ideation, planning and implementation phases

Introduce courses on social sciences and modules on general awareness

- Introduce courses on social sciences as part of curricula for the overall development of society
- Launch modules on general awareness/current affairs to produce better informed citizens and disseminate knowledge to improve standards of health, hygiene, sanitation, life expectancy and other social parameters
- Introduce full-fledged courses on social administration, public health, and cultural and heritage development

The curricula of Boston University's School of Engineering includes courses on social sciences and humanities along with mathematics, natural sciences, and basic engineering courses. These aim to enhance the ability of engineering students to communicate effectively and understand the impact of engineering solutions in the global, economic, environmental, and societal context

Several US universities such as the University of Albany and the University of Pittsburgh offer complete undergraduate courses in public health and social welfare

Key action steps for the initiatives mentioned above

- Develop content/pedagogy in accordance with the requirements of the courses
- Hire faculty with relevant qualifications and experience (especially entrepreneurs) to deliver the courses
- Train faculty to enable them to deliver the revised curricula
- Provide funding/incubation support for promising entrepreneurial ideas

Primary target

Source: Websites of Stanford University, Harvard University, Babson College, BU College of Engineering, University of Albany, University of Pittsburgh

Develop entrepreneurial ecosystems in institutions

- Babson College offers several entrepreneurship courses at the undergraduate level, such as Financing of Business, Managing Family Business, and Setting Up a Business in Growing Economies
- The Venture Accelerator Program at Babson College provides support to start-ups according to venture stage and type as well as entrepreneur experience and goals; it supported 9 ventures in Fall 2013
- StartX by Stanford University, has generated 100 start-ups since its inception in 2009. It receives funding from companies such as Cisco, Johnson and Johnson, and Amazon, besides the University itself
- i-Lab in Harvard University serves as a resource for students interested in entrepreneurship and innovation

Introduce courses on social sciences and modules on general awareness

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- Provide funding/incubation support for promising entrepreneurial ideas
1. Curricula and pedagogy
Promote continuing education for working professionals and introduce blended learning model using Massive Open Online Courses (MOOCs)

Promote lifelong learning for working professionals

- Promote the concept of “lifelong education” by developing continuing education programs for working professionals
- These could be either standardized, open enrolment programs or customized for certain industries, companies, and roles
- Encourage the practice of industry-sponsored / self-sponsored continuing education

Some continuing education programs offered by the University of Phoenix:
- Individual, credit-bearing courses on business and finance, nursing, health administration, etc.
- Courses for teachers which meet potential endorsement, recertification or professional development requirements
- Certificate programs in areas such as HR, project management, health administration, accounting and technology for working professionals
- Non-credit professional development courses

Key action steps
- Develop platforms for academia-industry interactions to facilitate collaborations
- Develop customized curricula for organizations to encourage them to send their employees for continuing education programs
- Hire trained and qualified/professionally experienced faculty to deliver these programs

Promote blended learning using MOOCs to deliver quality education

- Promote extensive use of a blended learning model, wherein:
  - Massive Open Online Courses (MOOCs)* are developed locally (in India) and are combined with those provided by the top global universities
  - Lectures delivered by local faculty are supplemented by pre-recorded lectures given by best-in-class faculty from the top institutions
- Two community colleges in Massachusetts have launched a blended learning program utilizing in-class sessions and material from an existing MOOC offered through edX by MIT
- The IITs are planning to offer basic IT courses in data structure, programming and algorithms through the MOOCs platform, for which credits would be awarded and counted towards degrees conferred to thousands of students across higher education institution in India

Key action steps
- Develop adequate bandwidth for fast and uninterrupted internet connectivity across all geographies
- Develop device-agnostic technology for accessing online content
- Devise a mechanism to enable higher education institutions in India to collaborate with MOOCs service providers and successfully deliver such courses

Source: University of Phoenix website, edX website
1. Curricula and pedagogy
Adopt the flipped classroom model to improve learning in the classroom

**Flipped classrooms**

- 50% content delivered face to face
- 50% content delivered online

**Traditional classroom**

- Instruction by faculty in classrooms
- Learning enhanced through homework based on in-class instruction
- Theory-based learning

**Flipped classroom**

- Instruction through material that is already available to students (including textbooks, videos and presentations) from India as well as international markets
- Understanding enhanced through discussions and activities in classroom after ‘pre-reading’
- Activity and practice-based learning ensures better understanding of concepts

**Key action steps**

- Develop adequate bandwidth to ensure fast and uninterrupted internet connectivity at higher education institutions across geographies
- Develop device-agnostic technology for accessing online content
- Develop content/pedagogy in accordance with the requirements, including self-learning material for online teaching as well as activity-based content for face-to-face teaching
- Train faculty in this ‘new age’ pedagogy to enable them to effectively deliver quality learning outcomes

**Primary target**

Top higher education institutions have started implementing the flipped classroom model

- Columbia Business School has revamped its MBA core curriculum for its 2013-15 batch, moving some course content online to free classroom time for discussion and activities
- The Indian School of Business (ISB) introduced the flipped classroom model in 2012 to teach students a course on entrepreneurial decision-making. It is planning to expand its usage of this active learning methodology to other courses as well

Source: “Colombia Launches Revamped MBA Curriculum,” Business Week, “‘Flipped’ classroom teaching clicks with B-Schools in India,” The Economic Times
2. Faculty
Ease recruitment norms

Modify norms relating to recruitment of faculty members and elaborate on the benefits of teaching as a career option for them

► Give adequate weightage to industry experience while recruiting faculty to encourage industry professionals to take up faculty positions
► Develop a mechanism to encourage industry professionals to take up part-time faculty assignments
► Depute faculty to relevant industries for short tenures to gain practical exposure to industry practices
► Recruit faculty members with postgraduate degrees for undergraduate courses instead of over-emphasizing the need for doctoral degrees
► Ease norms for top-tier institutions to hire the best talent from overseas and provide compensatory benefits to those who relocate
► Emphasize on the perquisites provided for taking up teaching as a full-time career

Adapting the Teach for India model in higher education
► Current K-12 model (Teach for India): Two-year full-time paid fellowship that places professionals as full-time teachers in under-resourced schools
► Proposed model in higher education: Paid fellowship for managerial-level professionals to take up teaching in colleges and universities for fixed periods of time

“There is lack of awareness amongst students and parents regarding growth opportunities available to faculty in higher education institutions in India.” - Chancellor of an Indian university

Key action steps

► Introduce reforms in the selection process of faculty members, based on the requirements of institutions
► Grant autonomy to best-in-class institutions to devise their own mechanisms to recruit faculty
► Ensure active participation of the industry in encouraging industry professionals to accept faculty positions (e.g., by offering sabbaticals, incentives such as high weightage to a teaching stint for career enhancement, etc.)

Primary target

Source: Teach for India website
2. Faculty
Retain high-quality faculty by implementing tenure-based system and providing incentives

Promote a tenure-based system in Indian higher education institutions, public and private, to retain the best talent

- Develop a tenure-based system in higher education institutions, whereby all faculty members need to serve an initial probationary period of five to six years
- After the probationary period, the bottom 20%-30% may not be offered tenure due to stringent evaluation conducted by senior professors and administrators, and the top 70%-80% get the job security and academic freedom to concentrate on research and individual knowledge enhancement
- Conduct periodic evaluation of tenured faculty for promotions and salary increases

- The average probationary period in community colleges in the US is three years. It is seven years in regular undergraduate colleges
- After the probationary period, a faculty member's research, publication, service, and teaching record is reviewed and a decision is taken whether he or she should be promoted to a tenure rank

Develop a strong performance culture by introducing a rewards-based system

- Develop a system of rewarding the best performing faculty members by providing performance-linked monetary and non-monetary benefits by implementing:
  - Annual performance appraisals
  - Explicit promotion standards
  - Performance-based remuneration system
- Introduce evaluation of faculty members' performance through regular student feedback and peer review
- Provide significant weightage to research while evaluating their performance
- Increase involvement of faculty in designing curricula, and decisions relating to pedagogy and examinations

Key action steps for the initiatives mentioned above

- Encourage all public and private higher education institutions to implement a tenure-based system
- Develop a structured and transparent framework to evaluate performance of faculty members
- Develop a transparent and effective performance-based remuneration system
- Implement a system of peer reviews and student feedback in all higher education institutions
- Appoint independent committees in institutions to ensure accountability and transparency in implementation of these initiatives

Source: Website of the National Education Association, US
2. Faculty
Introduce faculty development and exchange programs with top-end institutions

Emphasize faculty development to improve the quality of teaching in higher education institutions

Incentivize/facilitate mandatory faculty development/training programs

- Hold mandatory training programs for all faculty members in public and private institutions not only on the subject matter, but also to enhance the effectiveness of their teaching skills
- Conduct refresher courses to update faculty members on new, evolving and effective teaching techniques
- Support higher education institutions in organizing summer workshops conducted by leading international teachers and researchers for selected faculty members of Indian institutions, who can train others
- Send faculty members for three to six months in the best universities in the world for training
- Establish Teaching and Learning Centres (TLCs) in existing universities, preferably in those with a strong research culture, and design and conduct relevant undergraduate training

Develop a hub-and-spoke model for faculty development and exchange

- In this model, the faculty members of institutions in a region can participate in development programs conducted by the best faculty in the top institutions in the region
- For example, faculty members from IIT Delhi and Delhi Technological University can conduct faculty development programs for other engineering colleges in the National Capital Region.
- Such networks can be leveraged for exchange of faculty members

Key action steps

- Develop effective faculty-development programs in terms of content and structure
- Ensure fast and uninterrupted internet connectivity to deliver faculty training programs using virtual classrooms*
- Provide funding support to education institutions to enable them to organize activities such as summer workshops and exchange programs
- Ensure active participation by best-in-class faculty from top-tier institutions to be ‘hubs’ for training and development of junior and mid-level faculty members from other institutions

*Explained in detail under Digital Infrastructure
3. Research
Adopt the mentor model for developing research capabilities and incentivize international institutions to collaborate for research

**Adopt mentor model to develop strong research capabilities at leading research institutions in India**

- In this model, a leading international university with strong research capabilities can mentor four to five research-focused institutions in India to help them develop their research capabilities, framework, policies, governance structures, etc.
- This would provide Indian universities access to global knowledge and help them become world-class research-focused institutions.

**Promote collaborations between top-tier international institutions and Indian higher education institutions for high-quality academic research**

- This would include joint research programs and other research collaborations between top-tier international institutions and Indian higher education institutions across themes that are of mutual interest to them.
- Interaction and exchange of knowledge between them would lead to improvement in the quality of their research-based activities and generate increased interest in research.

**Key action steps for the initiatives mentioned above**

- Identify institutions/countries that will mutually benefit from research partnerships with Indian institutions.
- Identify areas that would be of mutual interest to international and Indian institutions to forge research-based collaborations.
- Provide attractive incentives to international institutions to engage in collaborative research activities with Indian institutions.
- Formalize tie-ups of Indian universities with leading international universities to operationalize the mentor model.
- Encourage initiatives such as UKIERI (India-UK partnership) and Obama-Singh 21st Century Knowledge Initiative to enhance educational relationships between countries.

Source: “For Indian academics, foreign varsities’ entry means strong tie-ups, sharper research & the best of global faculty,” The Economic Times

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3. Research
Develop centers of research excellence and promote collaborative research within academia as well as between academia and research centers

Develop centers of excellence in higher education institutions to conduct high-quality research activity

► Set-up centers of excellence/world-class research centers in top universities in India. These will be focused on areas aligned with the country’s long-term strategic interests. They would:
  ► Install world-class research infrastructure and technology
  ► Conduct cutting-edge research across the pure sciences, social sciences and humanities
  ► Attract the best research faculty from around the world

Key action steps
► Provide adequate funding for the creation of centers of excellence
► Identify the requirements of industries in India over the next 15-20 years to focus on areas that are of relevance in the larger economic and social context
► Attract reputed Indian faculty members working in top international institutions to return to India and work in these centers of excellence

Promote collaborative research within academia as well as between academia and research centers

► Promote the development of Inter-Institution Centers (IICs), which will be based on broad partnerships between multiple research-oriented institutions or program-specific partnerships between funding agencies and research institutions
► Establish linkages between national research centers/research laboratories and centers of excellence in the top universities to promote collaborative research

Key action steps
► Develop platforms for interaction between higher education institutions and research centers in the country to establish research-based relationships
► Incentivize collaboration between research institutions as well as between research centers and institutions
► Develop adequate infrastructure and the requisite environment for R&D in high-quality academic institutions
► Attract top-notch researchers to such institutions to lead collaborative research between multiple stakeholders
► Increase expenditure on R&D as a percentage of GDP
### 3. Research

**Develop industry and academia collaborations to promote applied research**

#### Incentivize/facilitate industry involvement in research activities at academic institutions

- Encourage research activity at academic institutions in areas that are of relevance to industry
- Engage industry players to provide funding, mentor research projects, and facilitate industrial visits
- Incentivize industry to set up sector-specific/horizontal-focused centers of excellence at higher education institutions
- Encourage live research projects that can be undertaken by higher education students and mentored by industry professionals

### China's higher education system: industry linkages for research

- In 1988, the Chinese government began officially encouraging universities to develop industry linkages for research
- Over the years, Chinese universities have developed various R&D linkages with industry such as technology-related contracts, joint research centers, transfer and licensing of technology, and university-based science parks
- R&D spend by Chinese universities increased at CAGR of 20% from CNY47.8 million (US$7.8 million) in 1996 to CNY200.9 million (US$33 million) in 2004

#### Key action steps

- Identify sectors/topics that are of relevance to industry to conduct applied research
- Develop platforms (forums, seminars, portals) for industry-academia collaboration and establish nodal agencies to coordinate these
- Incentivize industry to engage in collaborative research with academic institutions
- Develop adequate infrastructure and a favorable environment for R&D at academic institutions

#### Encourage community-focused/development-oriented research at academic institutions that are relevant for a particular community/region

- Encourage ‘Foundation Institutions’ to conduct research that is relevant to the economic and social requirements of the respective district/block in which they are located
- This would lead to social and economic upliftment of the block/district

#### Key action steps

- Incentivize/Provide funding for community-focused (or region-specific) development-oriented research
- Incentivize faculty and students to conduct community-focused research
- Ensure active participation of local industry

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Source: UNESCO report 2011: ‘In search of triple Helix’; University of Niagara website; University of Victoria website
3. Research
Attract high-quality research-oriented faculty by offering incentives and a conducive research environment

Attract best-in-class faculty to conduct research by providing incentives and creating a conducive research environment

► Provide higher salaries and perquisites to attract high-quality research faculty
► Limit the teaching load of faculty members to enable them to focus on research
► Upgrade research infrastructure to attract Indian research faculty working in world-class foreign universities
► Provide opportunities for consulting assignments and corresponding monetary benefits generated by these for faculty members
► Sponsor faculty members participating in seminars and conferences across the world

Key action steps

► Provide funding for development of research-oriented infrastructure
► Develop industry-academia collaboration for collaborative research
► Encourage corporate endowments for development of research capabilities
► Provide grants/scholarships to best-in-class faculty to carry out research activities
4. Partnerships
Strengthen industry-academia linkages and tie-ups between higher education institutions and skill-based training providers

Ensure industry interaction at all operational levels to synchronize the country’s higher education system with the requirements of industry

**Higher education institution**

- Administration & governance
  - Industry professionals in the institution’s governing body
- Delivery of education
  - Involvement of industry experts in designing curricula
  - Regular seminars/conferences
  - Live industry projects
  - Industry professionals encouraged to take up faculty positions for fixed terms (similar to the “Teach for India” program in schools)
  - Sharing of live case studies
  - Counseling/mentoring by industry practitioners
- Employment and research
  - Partnerships for internships and placement
  - Sharing of research facility

**Industry**

- Leadership
- Middle/Senior-level management
- HR and R&D department

Promote tie-ups/partnerships between higher education institutions and skill-based training providers to launch employment-oriented modules

**Key action steps**

- Develop a structure to formalize collaborations between higher education and skills-training institutions
- Undertake regulatory reforms to enable collaborations
- Devise a policy to provide recognized certification to higher education students for the skills training programs they attend

**Primary target**

- Develop a system of engagement/partnership between higher education institutions and skill-based training providers, whereby the latter provides various skill-oriented training modules/courses to the former’s students to enhance their employability
5. Infrastructure - physical
Increase capacity of the higher education system, targeting specific outcomes by setting up new institutions and increasing intake of existing ones

Undertake strategic expansion of the higher education system to increase access to education for all social groups and geographies while complying with basic quality standards

Set up new institutions (brick-and-mortar) to address critical regional and social gaps

- Establish higher education institutions in educationally deficient geographies (states/districts)
- Set up institutions that target socially relevant groups (based on gender, community, etc.)
- Establish institutions that are aligned to the aspirations of students as well as the needs of the economy

Key action steps

- Ensure availability of government grants for creation of infrastructure
- Identify and prioritize educationally deficient geographies and socially relevant groups
- Ensure efficient and unbiased implementation of expansion plans
- Incentivize private participation to encourage industry players to cater to relevant groups/geographies
- Scale up hiring of faculty and conduct training for effective delivery

Expand scale of existing higher education institutions

- Expand the student base of existing quality higher education institutions by increasing intake at their campuses
- Allow reputed institutions to set up additional campuses, replicating their teaching and research-based culture in the new campuses

Key action steps

- Ease norms to allow established higher education institutions to increase their intake in the popular streams in existing campuses
- Deploy existing physical facilities more efficiently by scheduling multiple shifts and year-round operations
- Utilize surplus land in higher education institutions to build additional capacity, and improve campus design and layout for improved utilization of land
- Incentivize institutions to consolidate capacity through mergers
- Scale up hiring of faculty and train them for effective delivery of education

Source: American Association of Community Colleges, ISB website, News report - The Times of India, University of Hawaii website
5. Infrastructure - physical
Incentivize high-quality private and foreign players to enhance quality capacity in the higher education system

Incentivize select private participants to establish high-quality institutions

- Provide monetary/non-monetary incentives to established players as well as potential entrants in the higher education space to set up quality institutions
- Devise innovative ways to encourage infusion of philanthropic capital in traditional higher education institutions
- An increased number of players would encourage competition to attract high-quality students and continuously enhance quality

South Korea: a case in point
- In 1990, the Korean government started subsidizing private higher education institutions on a competitive basis to enhance the overall quality of higher education
- The high degree of privatization was carried out through a coherent set of incentive mechanisms
- Financial incentives included public subsidy, tax exemption, and other measures
- By 2010, 15 out of the top 20 Korean Universities (listed by JoongAng, a national daily) were from the private sector

Allow high-quality foreign universities to open branch campuses in India

- Allowing quality foreign universities to open branch campuses in India would bring in global best practices to the country and enhance its existing knowledge base
- This would lead to increased competition and improvement in the standards of existing higher education institutions in India
- UGC is planning to allow the entry of the top 400 global universities to set up campuses in India on a not-for-profit basis

Several countries have allowed / incentivized foreign universities to set up campuses in their countries
Some examples are given below:
- China: University of Nottingham (UK), New York University (US), John Hopkins School of International Studies (US)
- Qatar: Carnegie Mellon University (US), Georgetown University (US), Weill Cornell Medical College (US)
- Singapore: INSEAD (France), University of Chicago’s Booth School of Business (US), New York University’s Tisch School of the Arts (US)

Key action steps

- Develop favorable policies/norms for foreign institutions to set up branch campuses in India
- Incentivize foreign institutions by allowing them to repatriate a portion of their earnings to their home countries

Source: Research paper by Pennsylvania State University 2011; Sinograduate website, Dubai International Academic City website, ADBI report 2012; Internationalization of Tertiary Education Services in Singapore; University of Bristol Report 2010: Higher Education Reforms in South Korea; Cite Seer website
5. Infrastructure - digital
Develop technology-based models such as virtual classrooms to widen access to high-quality teaching

Set up virtual classrooms to widen reach/access

- Enable best-in-class faculty to deliver teaching to students in remote areas or with limited mobility (working professionals, women, people with disabilities) using the latest technology (such as 4G, VSAT, and web conferencing)

University of Phoenix, United States
- Content available online to students across the world
- More than 100 locations in the US where classes are conducted through moderators
- Student-instructor interaction through electronic media
- Students control the time and place of participation

BITS Virtual University
BITS has deployed a virtual lecture facility by connecting classrooms through a Multiprotocol Label Switching (MPLS) based data network. This platform would also enable professors to record lectures and make it available for replay, thereby providing access to key content at any location at any time.
- This is provided as a supplementary facility provided to students pursuing degrees through BITS’ Distance Learning Programmes division. Currently, nine courses are offered through this mode
- Students from all the BITS campuses can interact with experts from across the world for guest lectures, workshops and other academic pursuits in real-time. This would benefit 11,000 students and 700 teachers

Key action steps
- Develop adequate bandwidth to ensure fast and uninterrupted connectivity for higher education institutions across geographies
- Build computer labs and increase availability of laptops and low-cost access devices
- Create device-agnostic digitized content and pedagogy
- Formalize tie-ups with best-in-class faculty in India/globally to deliver content
- Create an affordable pricing model to maximize usage of virtual classrooms

Source: University of Phoenix website, BitS Virtual University website, “Cisco deploys virtual lecture facility in BITS Pilani,” The Times of India
5. Infrastructure - digital
Enable low-cost access to high-quality education on a mass scale through the MOOCs platform

Leverage the MOOCs model to provide access to high-quality content / courses from top institutions to millions of students across the country

Coursera - pioneer in offering MOOCs
► Launched in 2012; partners with top universities and organizations in the world to offer massive open online courses (MOOCs) for free
► Offers 535 courses in a wide range of topics, spanning humanities, medicine, biology, social sciences, mathematics, business and computer science
► Has partnered with over 100 universities including the likes of Stanford University, Princeton University, the University of Michigan, and the University of Pennsylvania
► Has 4.3 million users currently, with Indians being the second biggest segment after Americans

Adoption of the MOOCs model by higher education institutions in India
► IIT Bombay - edX partnership: edX, an international provider of MOOCs, has partnered with IIT Bombay to make courses developed by the institutions available to students around the world

Key action steps
► Develop adequate bandwidth to ensure fast and uninterrupted internet connectivity for higher education institutions across all geographies
► Develop device-agnostic technology for accessing MOOCs
► Encourage institutions providing these courses to offer certifications that are recognized and accepted by the industry for employability of students

Source: Coursera website, “India second largest in edX enrolment,” The Hindu
5. Infrastructure - digital
Utilize existing infrastructure and schemes to increase access and improve quality of education imparted

Increase effectiveness of National Knowledge Network (NKN) and National Mission on Education through ICT (NMEICT) to increase access to high-quality education through content-sharing

Key action steps

**Improve access and quality**
- Support under-resourced higher education institutions to help them develop the required ICT capacity to benefit from technological initiatives such as NKN and NMEICT
- Establish a single national-level consortium of proprietary content
- Create open-access content repositories from which institutions should have the option of selecting modules they want to use
- Use other advanced media of connectivity such as wi-fi and mobile technology, and not be restricted to EDUSAT (India’s higher education satellite)
- Develop framework for procurement and development of e-content in addition to existing knowledge resources

**Enhance quality of R&D across institutions**
- Further develop the NKN for content-sharing and collaboration in R&D activities across all higher education institutions in the country
- Ensure ubiquitous access to all scholarly content for all students
- Encourage increased interactions between centers of excellence at top universities and other research centers

**Encourage stakeholder involvement and train users**
- Develop a framework that ensures the involvement of every stakeholder in planning and execution of NMEICT to increase its effectiveness
- Clarify the role of each stakeholder to make NMEICT effective
- Formulate a clear policy and devise an execution road-map to leverage NKN
- Train and orient people in the age group of 25-35 years to use these knowledge networks, since they will be future teachers and faculty members

Primary target
6. Funding
Provide competitive research grants from government and encourage corporate endowments

Provide ‘competitive’ access to government research grants through a merit-based system to incentivize and support R&D activity

- Research grants to higher education institutions should be provided on a competitive basis through a well-defined methodology, irrespective of the ownership of the institution i.e. private or public
- Evaluation parameters should include a combination of the inputs required to conduct research and outcomes the institution have delivered over the evaluation period
- The research grant given to a particular institution will therefore vary according to its performance on these parameters

Methodology for providing research grants in the UK

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<td>Number of qualified researchers</td>
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<th>Qualitative assessment</th>
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<td>Evaluation of overall quality of research by a committee comprising peers</td>
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Key action steps

- Devise a methodology to evaluate the performance of a higher education institution in the field of research
- Appoint an independent agency to assess the institution that is to receive research grants
- Ensure efficient and transparent disbursement of grants to eligible institutions

Encourage endowments from industry by multiple means:
- **Direct funding:** Provision of funds to higher education institutions to support research-based activities
- **Indirect funding:** Developing research facilities/centers of excellence at institutions including infrastructure, faculty training, industry mentoring, industrial visits, etc.

In 2011, Duke University received US$215 million from corporates, the highest corporate funding given to a university in the US in that year

Massachusetts Institute of Technology (MIT) received US$110 million in the same year, the second highest corporate endowment to a university

Key action steps

- Develop platforms for industry-academia collaboration to promote corporate funding
- Devise policies to incentivize organizations to contribute to research-based activity at universities

6. Funding
Increase individual-centered funding and implement outcome-based public funding

Promote individual-based funding vis-à-vis institutions-based funding

- Funding provided directly to meritorious and need-based students to pursue higher education, vis-à-vis subsidizing public institutions
- Enables students to utilize the funds to study in his/her institution of choice
- Leads to improvement in quality of higher education institutions, with each institution endeavoring to attract the best students

Key action steps
- Strengthen center-state coordination to ensure equitable and merit-based selection of students across geographies and communities
- Ensure timely, efficient and transparent system of disbursements of funds to individuals

Link public funding to performance/outcomes of institutions

- Devise a system of outcome-based funding, whereby funding to institutions is linked to their performance against milestones and targets laid down in their strategic plans
- Greater autonomy should be provided to institutions in the use of funds, while ensuring greater responsibility in the effective utilization of those funds
- Higher education institutions should be completely transparent about their financial performance by putting up their financial statements on-line

Key action steps
- Encourage all higher education institutions to develop strategic plans
- Develop mechanisms to track the individual performance of higher education institutions based on their strategic plans
- Ensure timely and transparent disbursement of funds based on the performance of institutions

The Government could gradually move towards spending two-thirds of its allocated budget on individual funding over the next two decades

Primary target
6. Funding
Encourage alumni funding

Top-tier institutions, with a strong alumni base should encourage their alumni to provide funding to achieve specific objectives, including:
► Development of infrastructure and technology
► Building of strong research capabilities
► Provision of scholarships to deserving students
► Organization of seminars and other forums that can promote industry-academia collaborations
► Alumni who have contributed toward development of their alma mater should be given due recognition for their contributions

Examples of alumni funding to some of the top global universities
► Yale University: US$250 million from Charles B. Johnson towards university expansion (2013)
► Harvard University: US$125 million from a Swiss philanthropist Hansjörg Wyss to support a bioengineering institution (2013); US$50 million from Ratan Tata for the development of the HBS campus in Boston (2010); US$10 million from Anand Mahindra for the development of a humanities center (2010)
► Stanford University: US$151 million from businessman John Arrillaga to support various university projects (2013)

Key action steps
► Develop structured alumni networks with periodic alumni meets, conferences, etc.
► Create an alumni team comprising existing students of the institution to liaison with alumni
► Promote regular correspondence between the institution and the alumni base through mailers, newsletters, etc.
► Create an alumni endowment fund to record the details of the alumni endowments coming in
► Develop a mechanism to ensure transparent utilization of the funds given by alumni
► Ensure regular updates to alumni on the status of utilization of funds by the institution

Source: News report: Bloomberg Businessweek, Washington Post, Wall Street Journal; Yale University website; Harvard University website
7. Governance/Leadership
Introduce reforms in the regulatory framework governing higher education to reduce ambiguity and promote self-regulation

**Simplify rules and regulations to make the regulatory structure transparent and unambiguous**

**Key action steps**

- Simplify the regulatory framework to reduce ambiguity in rules and regulations governing India’s higher education system by implementing the following:
  - Development of a centralized repository/portal with all the rules and regulations governing India’s higher education system for easy and efficient access
  - Swifter system of seeking approvals

**Recommend governance frameworks that can be adopted by all higher education institutions for self-regulation**

**Key action steps**

- Develop model governance frameworks that can be adopted/emulated by all private and public higher education institutions
- Ensure effective self-regulation in all higher education institutions by their seeking guidance/direction from suggested frameworks

**Introduce system of mandatory accreditation for all higher education institutions by independent organizations**

**Key action steps**

- Establish a national accreditation agency and several smaller, independent agencies with specialized focus
- Allow these agencies to evaluate public as well as private higher education institutions based on an agreed upon and publicly disclosed evaluation criteria that are different for the various types of institutions; incorporate peer review into the evaluation framework
- Allow select group of credible international accrediting bodies to evaluate/rate Indian higher education institutions
- Allow fledgling institutions to grow and find a foothold before subjecting them to scrutiny
7. Governance/Leadership

Promote disclosure of information by all higher education institutions to make the system accountable and transparent

Create a differentiated governance structure based on the quality of institutions

**Key action steps**

- Instead of a uniform regulatory structure for all higher education institutions, put in place a differentiated structure based on the quality of institutions
- The Government would:
  - Play a promotional and evaluative role for top-quality institutions, allowing them increased autonomy
  - Play a steering role for mid-quality institutions
  - Actively regulate lower-quality institutions

Ensure accountability and transparency in the functioning of regulators and accreditation bodies

**Key action steps**

- Ensure that regulators and accreditation bodies comply with service standards and timelines set for them to perform their roles
- Ensure transparency in the functioning of regulators and accreditation bodies, with public accountability reporting based on pre-defined frameworks

Create a centralized repository of all information related to higher education; ensure mandatory disclosure for all higher education institutions

**Key action steps**

- Install ERP across all higher education institutions to capture key information related to admission, fees, faculty, governance, placements, financial details, infrastructure, accreditation, etc., in a standardized format
- Develop a centralized database, which can be accessed by all, to aggregate information from individual higher education institutions
- Ensure constant/automatic updates as and when there are changes in existing institutions/new institutions are established
- Undertake regular audits of the centralized database to check its accuracy
- Ensure mandatory disclosure of key financial and operational details by all private and public higher education institutions
7. Governance/Leadership
Introduce reforms in the leadership structure of institutions

Provide thrust towards internationalization of leadership

Key action steps

► Select institutional leaders through an open and competitive process
► Incentivise reputed international academics and administrators to take up leadership positions in Indian universities

Separate ownership and management for effective governance; Mandate creation of effective and accountable Boards of Management (BoMs)

Key action steps

► Create a governance structure with a professionally-run management that operates independent of the ownership of the higher education institution
► Devise a framework that clearly details roles and responsibilities of top management and faculty in institutional governance, as well as the roles of other stakeholders, including students, alumni, and employers, in ensuring effective governance
► Create Boards of Management (BoMs) in every institution on similar lines as the Board of Directors of corporate organizations, consisting of a mix of elected and nominated representatives, with active participation/representation of academia, alumni, and industry
► The BoMs will be the apex governance body of institutions, and will further create appropriate committees with clearly defined responsibilities and accountability
Annexure

The current state of Indian higher education
The current higher education system in India is massive with over 30 million students enrolled across 45,000 institutions.

**Enrollments**

- **Total enrollment (2013-14 est.):** 30.5 million
  - Regular brick and mortar – 84%
  - Distance education – 16%

**Gross enrollment ratio (2013-14 est.):** 22.5%

**Institutions**

- **Number of institutions (2011-12):**
  - Colleges: 33,023
  - Diploma-granting institutions: 12,748
  - Universities: 659

*Extrapolated basis 2011-12 data from Twelfth Five Year Plan: chapter on higher education*

Despite the current size, India’s GER lags that of other leading countries.

India’s GER lags behind that of developed countries such as the US, Switzerland, Japan and the UK as well as the developing countries such as China, Brazil, Malaysia and the Philippines.

Compared to developed countries, India witnesses more enrollment in Arts and Engineering while enrollment in Medical studies is lower.

Differences in enrollment across countries are driven by historical preferences and industry structure.

Stream-wise split for enrollment 2011

*Others include personal services, social services, transport services, hospitality and environmental protection.

Differences in enrollment across countries are driven by historical preferences and industry structure.

The higher education system has grown significantly in the past two decades in terms of the number of institutions and enrollment.

- The number of universities/institutions of national importance has registered a seven-fold growth in the last four decades.
- India has more than 33,000 affiliated colleges with around 20,000 added after 2000-01.

### GER in higher education has more than doubled since 1999-2000

<table>
<thead>
<tr>
<th>Year</th>
<th>GER (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979-80</td>
<td>5.0%</td>
</tr>
<tr>
<td>1989-90</td>
<td>6.0%</td>
</tr>
<tr>
<td>1999-00</td>
<td>10.0%</td>
</tr>
<tr>
<td>2006-07</td>
<td>12.3%</td>
</tr>
<tr>
<td>2011-12</td>
<td>17.9%</td>
</tr>
<tr>
<td>2012-13</td>
<td>18.8%</td>
</tr>
<tr>
<td>2013-14E</td>
<td>22.50%</td>
</tr>
</tbody>
</table>

### Student enrollment has grown 12 times in the last four decades, increasing at a CAGR of 10.4% since 2000-01

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrollment (in million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-91</td>
<td>4.9</td>
</tr>
<tr>
<td>2000-01</td>
<td>8.4</td>
</tr>
<tr>
<td>2006-07</td>
<td>16.6</td>
</tr>
<tr>
<td>2011-12</td>
<td>25.9</td>
</tr>
<tr>
<td>2013-14E</td>
<td>30.5</td>
</tr>
</tbody>
</table>

### Number of universities

- CAGR: 5.3%

### Number of colleges

- CAGR: 6.5%

Source: Twelfth Five Year Plan: Chapter on higher education, UGC: Higher education in India at a glance, June 2013, MHRD Annual report 2011-12, EY estimates.
Distance education, which offers affordable education to masses, has grown significantly in the recent past; high quality central institutions have also exhibited strong growth.

Enrollment in distance education programs has more than tripled in the last decade growing at a CAGR of 11%.

The number of institutions offering distance education is almost five times the number two decades ago.

The Govt. had doubled the number of central institutions over the last 6-7 years.

A variety of courses and career-oriented programs have emerged across different streams.

<table>
<thead>
<tr>
<th>Course</th>
<th>Innovative trends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Rapid growth of niche specializations such as bioinformatics, environmental, thermal power &amp; energy systems</td>
</tr>
<tr>
<td>Management</td>
<td>Sector-focused management programs such as family business, retail, real estate and urban infrastructure – 1Y/part-time/executive programs</td>
</tr>
<tr>
<td>Arts</td>
<td>New course structures such as 4Y research-focused liberal arts programs</td>
</tr>
<tr>
<td>Science</td>
<td>Emergence of applied science courses such as actuarial science, clinical optometry, drug regulatory affairs, biotech dietetics and applied nutrition</td>
</tr>
</tbody>
</table>

Source: Twelfth Five Year Plan: Chapter on higher education 2012, UGC: Higher education in India at a glance, June 2013, MHRD Annual report 2012-13
Progress in higher education in India has been driven by several factors

Enablers of progress in the higher education sector

1. International collaborations
   - Increase in collaborations between Indian and foreign universities for faculty support and curriculum design, joint research, student-faculty exchange and twinning programs

2. Increasing government allocation
   - Increase in the share of the unaided private sector in terms of the number of institutions and enrollment since 2001
   - Rise in the share of state private universities due to increased private participation (CAGR: 44% since 1995)

3. Increasing industry-academia partnerships
   - Initiatives include guest lectures by industry practitioners, management development programs, live projects, consulting assignments, joint seminars, scholarships etc.
   - Participation of industry bodies such as FICCI and institutions such as ISB, the IIMs and the IITs

4. Increasing private participation
   - Increase in the share of the unaided private sector in terms of the number of institutions and enrollment since 2001
   - Rise in the share of state private universities due to increased private participation (CAGR: 44% since 1995)

   - Increased budgetary allocation for higher education by the Government
   - Budgetary allocation for implementation of National Mission on Education through Information and Communication Technology (NMEICT)
   - Establishment of new model degree colleges
   - Setting up of National Knowledge Network (NKN)
The private sector has played a significant role in expansion of capacity

1 Private sector and corporate participation is increasing

The share of the unaided private sector has increased significantly since 2001 in terms of the number of institutions and enrollment

![Bar chart showing the share of institutes and enrolments](image)

- **Share of institutes**
  - 2001: 42.6%
  - 2007: 61.8%
  - 2012: 63.9%

- **Share of enrolments**
  - 2001: 32.9%
  - 2007: 54.2%
  - 2012: 58.9%

The number of state private universities has increased by 150 over the last decade...

- Several private universities have been established recently with the support of the corporate sector.
  - GD Goenka University (2013)
  - Shiv Nadar University (2011)
  - Azim Premji University (2011)
  - Jaypee University of Engineering & Technology (2010)
  - Dr. K.N. Modi University (2010)
  - O.P. Jindal Global University (2009)

…partly driven by the increased participation of the corporate sector

![Graph showing the number of state private universities](image)

```

1 2 14 28 82 140 165*
```

*as on 28th October 2013

Source: Twelfth Five Year Plan, Planning Commission, UGC Annual Report 2011-12,
The Government, on its part, has increased the higher education budget and implemented several technology initiatives to improve the quality of higher education.

**Supportive government initiatives**

### Increased budget allocation

- The Government of India has increased its planned expenditure on higher education by 37%, from INR195.1 billion in 2011-12 to INR267.5 billion in 2013-14.
- Budget allocation under Rashtriya Uchhatar Shiksha Abhiyan (RUSA) during the Twelfth and Thirteenth Five Year Plans is INR980 billion, of which the Central government will spend INR700 billion.

### Implementation of National Mission for Education through ICT (NMEICT)

- The Government’s allocation of INR40 billion during the Twelfth Five Year Plan for NMEICT.
  - Objective: To create high quality, curriculum-based interactive content for all subjects and host them on the Learning Management System (LMS) platform in open access.
  - Opportunity for all teachers and experts to pool their knowledge and resources for the benefit of every Indian student.
  - Initiatives on generation of e-content by the Consortium for Educational Communication for 68 subjects in undergraduate level courses and 77 subjects in postgraduate level courses.
  - INR477.2 million to Indian Institute of Technology, Rajasthan, for acquisition and testing of low-cost computing devices.

### National Programme on Technology Enhanced Learning (NPTEL)

- A joint initiative of the IITs and IISc enabling e-learning through online web and video courses in engineering, science and humanities streams aiming to enhance the quality of education provided in the country.

### National Knowledge Network (NKN)

- To interconnect all universities, libraries, laboratories, hospitals and agricultural institutions to share data and computing resources across country over a high-speed information network with gigabit capabilities.
  - NKN has already connected 824 institutions and aims to connect more than 1500 institutions/organisations/laboratories under various categories throughout the country.
  - It also focuses on providing digital campuses, video-conference classrooms, wireless hotspots, and laptops/desktops to all students enrolled in professional/science courses, and Wi-Fi connectivity in hostels.

### Establishment of new model degree colleges in educationally backward districts (EBDs)

- Objective: To enhance access to degree courses in EBDs in the country, to achieve expansion in higher education with inclusion, equity and quality.
  - Financial assistance for establishment of Model Degree College in each of the identified 374 EBDs where the GER of higher education is less than the national GER.

Source: MHRD Annual Report 2012-13, Union Budget 2013-14, National Knowledge Network website.
Several Indian institutions are increasingly collaborating with international ones

### Increasing international collaborations

#### Forms of collaborations

<table>
<thead>
<tr>
<th>Link programs</th>
<th>Dual-degree programs</th>
<th>Twinning programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research projects</td>
<td>Faculty/student exchange</td>
<td>Other collaborations such as curriculum development and e-learning</td>
</tr>
</tbody>
</table>

#### Some collaborations by Indian institutions

<table>
<thead>
<tr>
<th>Indian Institutions</th>
<th>Foreign Institution</th>
<th>Collaborations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISB, Hyderabad</td>
<td>MIT Sloan School of Management, US</td>
<td>Faculty support and curriculum design</td>
</tr>
<tr>
<td>Great Lakes Institute of Management</td>
<td>Yale University, University of Houston, Nanyang Technological University</td>
<td>Joint research, academic programs, and student/faculty exchange</td>
</tr>
<tr>
<td>Indian Institute of Science</td>
<td>University of Leicester, UK</td>
<td>Joint research on air vehicles</td>
</tr>
<tr>
<td>Shiv Nadar University</td>
<td>Carnegie Mellon University, US</td>
<td>Twinning program in engineering</td>
</tr>
</tbody>
</table>

#### Split of foreign players collaborating with Indian institutions - by country (2007)

- **UK**: 34%
- **US**: 29%
- **Australia**: 8%
- **Canada**: 7%
- **Switzerland**: 3%
- **Germany**: 2%
- **France**: 1%
- **Others**: 16%

#### Obama-Singh 21st century knowledge initiative

- Announcement of eight new partnerships in sectors including health, technology, energy and sustainable development, and training of human resources
- Each project will receive an award of US$250,000 for developing online education, fostering economic growth, generating shared knowledge to address global challenges, and developing junior faculty at Indian and US higher education institutions

Source: UKTI Report 2007, United States-India Educational Foundation website, Websites of higher education institutions
Higher education institutions are also collaborating with industry players to maximize industry interaction throughout the value chain.

### 4 Industry academia partnership

#### Avenues of industry-academia interaction

<table>
<thead>
<tr>
<th>Institution/Organization</th>
<th>Key Initiatives</th>
</tr>
</thead>
</table>
| FICCI - National Knowledge Functional Hub (NKFH) | ► FICCI’s collaborative framework through a hub and spoke model, engaging industry and academic institutions to create a knowledge network  
► Key initiatives including curriculum designing workshops, industry exposure visits for students and faculty, leadership programs and mentoring of students by industry professionals through live projects |
| ISB Hyderabad | ► SREI Infrastructure sponsoring a student run professional club at ISB and mentoring its members  
► Experiential Learning Programme’– collaboration between student teams and industry on real-world business issues to encourage application base learning outside the classroom  
► Annual industry events –ISB Leadership Summit (ILS) and ISB Pinnacle held at the Hyderabad and Mohali campuses respectively |
| IIT Kanpur | ► Joint research in material sciences with Unilever |
| Tech Mahindra and five Indian universities | ► Imparting technical skills of IT Infrastructure Management Services (IMS) to students |
| IIM Bangalore and Infosys BPO | ► Partnership in developing course content |
| Aditya Birla Group and IIMs | ► Scholarships to students |
| Delhi Technical University and Samsung Electronics India Ltd. | ► Knowledge sharing through in-house tutorials, workshops, sponsored doctoral and post graduate programs as well as joint research |

While the higher education system in India has witnessed significant expansion and progress over the past decades, there are some systemic issues that need to be addressed.

**Higher Education in India: Vision 2030**

**1. Curricula and pedagogy**
- Outdated curricula not reflecting the requirements of dynamic market environment
  - Vacant faculty positions, even in top institutions
  - Inadequate teacher training
  - High student-teacher ratios

**2. Faculty**
- Low focus on research, even in top institutions
- Lack of industry involvement to drive industry oriented research

**3. Research**
- High quality partnerships with foreign institutions restricted to a few institutions
- Allocated funding for infrastructure development not being utilized effectively

**4. Partnerships**
- Low government spending on research relative to other countries

**5. Infrastructure**
- Multiple regulatory bodies with duplication and ambiguity of regulations

**6. Funding**
- Significant disparity in higher education across genders, social groups and geographies
- Low employability of graduates perceived by industry
- Lagging behind other countries in university rankings and research output

**7. Governance/Leadership**
- Widen the reach and enhance affordability of higher education so that it is accessible to all strata of society
- Support India’s economic agenda by creating job-ready and employable workforce through increased focus on imparting structural and technical skills
- Pushing the frontiers of knowledge by enhancing quality and building excellence through research, partnerships etc.
There is wide disparity in the GAR across genders, social groups and regions.

**Access to higher education for all minority social groups is much below the national average**

<table>
<thead>
<tr>
<th>Year</th>
<th>National average</th>
<th>OBC</th>
<th>SC</th>
<th>Muslims</th>
<th>ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2000</td>
<td>10.1</td>
<td>7.0</td>
<td>5.1</td>
<td>NA</td>
<td>6.4</td>
</tr>
<tr>
<td>2004-2005</td>
<td>12.6</td>
<td>10.1</td>
<td>7.8</td>
<td>7.7</td>
<td>7.6</td>
</tr>
<tr>
<td>2007-08</td>
<td>17.2</td>
<td>14.8</td>
<td>11.6</td>
<td>9.6</td>
<td>7.7</td>
</tr>
</tbody>
</table>

*Statistics for 1999–2000 and 2004–05 as per student enrollment, 2007–08 as per student attendance

**There is significant gender disparity**

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>National average</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2000</td>
<td>12.1</td>
<td>10.1</td>
<td>8.0</td>
</tr>
<tr>
<td>2004-05</td>
<td>14.4</td>
<td>12.6</td>
<td>10.6</td>
</tr>
<tr>
<td>2007-08</td>
<td>19.0</td>
<td>17.2</td>
<td>15.2</td>
</tr>
</tbody>
</table>

*Statistics for 1999-2000 and 2004-05 is based on student enrollment, 2007–08 is on students’ attendance

**In 2007–08, the GAR in urban areas was almost three times that in rural areas**

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban</th>
<th>National average</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2000</td>
<td>21.7</td>
<td>10.1</td>
<td>5.6</td>
</tr>
<tr>
<td>2004-2005</td>
<td>23.8</td>
<td>12.6</td>
<td>7.5</td>
</tr>
<tr>
<td>2007-08</td>
<td>30.0</td>
<td>17.2</td>
<td>11.1</td>
</tr>
</tbody>
</table>

*Statistics for 1999-2000 and 2004-05 is based on students’ enrollment; 2007–08 is on students’ attendance

- "...gross enrollment in the country in 2010 was only about 19%, which is much below the world average of 29%.. Adding to the woes is the low enrollment rate of the disadvantaged sections which is much below the national average" -
- "...many places in our country do not have higher educational institutions that are within the practical reach of aspiring students"

*Excerpt from the speech by Shri Pranab Mukherjee, President of India at the 90th convocation of the University of Delhi*

Source: Eleventh Five Year Plan: Chapter on Higher and Technical Education, Twelfth Five Year Plan: Chapter on higher education, UGC report: Issues related to expansion, inclusiveness, quality and finance November 2008, Press Information Bureau Govt. of India
a. Social value

The southern states have a higher GER than northern and eastern states.
b. Economic value
Employability is a key concern

Almost half the graduates are not employable in any sector, based on the industry standards of employability

Employable graduates for different industries (percentage)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Employable</th>
<th>Non-employable</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>75%</td>
<td>25%</td>
</tr>
<tr>
<td>BPO/Telesales</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Banking &amp; finance</td>
<td>85%</td>
<td>15%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Community services</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>Construction</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>Healthcare</td>
<td>45%</td>
<td>55%</td>
</tr>
</tbody>
</table>

Graduates’ employability varies significantly across institutions; Of the total number of employable graduates, a significant proportion comes from the country’s top 30% of colleges

Percentage of employable pool in top 30 percentile campuses and the rest of the campuses

<table>
<thead>
<tr>
<th>Field</th>
<th>Top 30% campuses</th>
<th>Rest of the campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales and</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Teaching</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>Accounting</td>
<td>41%</td>
<td>59%</td>
</tr>
<tr>
<td>IT services</td>
<td>36%</td>
<td>64%</td>
</tr>
<tr>
<td>Anti-RF</td>
<td>19%</td>
<td>81%</td>
</tr>
</tbody>
</table>

FICCI-World Bank employer satisfaction survey, 2009

Key results of survey conducted across 150 companies in India
- Around 64% of the surveyed employers are “somewhat”, “not very”, or “not at all” satisfied with the quality of engineering graduates’ skills
- Top skill gaps
  - General skills – reliability, self motivation and willingness to learn
  - Specific skills – problem solving, ability to design and conduct analyses, and reading

“Companies are able to select only 8-9 out of 100 people who apply and that’s a pretty low selection ratio”
- Kiran Karnik, former President NASSCOM

“... too many of our higher educational institutions are simply not up to the mark... still producing graduates in subjects that the job market no longer requires,”
- Excerpt from the Prime Minister’s speech at a conference of vice-chancellors of central universities at Rashtrapati Bhawan in February 2013

“Only 5% of India’s labour force in the age group 19-24 years is estimated to have acquired formal training.”
- Excerpt from the address delivered by S Ramadorai, Advisor to the Prime Minister in National Skill Development Council at the Center for the Advanced Study of India (CASI) University of Pennsylvania

"Employability is one such challenge, which has grappled India. Around eight million students join the workforce but only 10 to 15 lakh get jobs.”
- Excerpt from the speech delivered by Jitin Prasada, Minister of State for Human Resource Development at the third National Conference of Vice Chancellors of open universities in September 2013

c. Intellectual value
India lags behind the other BRIC nations in university world rankings and research output/impact

Global rankings
Only four Indian higher education brands featured in the Times Higher Education World University Rankings 2013-14 of the top 400 global universities.

Out of the 48 countries studied, India ranks second last in the U21 rankings of national higher education systems.

<table>
<thead>
<tr>
<th>Country</th>
<th>U21 Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>100</td>
</tr>
<tr>
<td>Australia</td>
<td>77.2</td>
</tr>
<tr>
<td>UK</td>
<td>74.9</td>
</tr>
<tr>
<td>Russia</td>
<td>49.5</td>
</tr>
<tr>
<td>China</td>
<td>44.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>45.6</td>
</tr>
<tr>
<td>India</td>
<td>36.3</td>
</tr>
</tbody>
</table>

Research
Academics in China authored almost five times more research papers than India’s academics in 2011.

The relative impact of citations for India is half of that of the world average.

<table>
<thead>
<tr>
<th>Country</th>
<th>Relative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>1.25</td>
</tr>
<tr>
<td>United States</td>
<td>1.24</td>
</tr>
<tr>
<td>Japan</td>
<td>0.81</td>
</tr>
<tr>
<td>China</td>
<td>0.61</td>
</tr>
<tr>
<td>India</td>
<td>0.51</td>
</tr>
</tbody>
</table>

There is need for Indian universities to catch up with counterparts in the quality of teaching and research. Research and innovation must be given new impetus. Out of 260 lakh students who were enrolled at the undergraduate level and above in 2011-12, only one lakh or 0.4 per cent had registered for PhD. The total number of patent applications filed by Indians in 2010, was close to only six thousand, while 3 lakh applications were filed by Chinese, around 1.7 lakh by Germans, 4.5 lakh by Japanese, and 4.2 lakh by Americans. The number of patent applications by Indians comprised only 0.3 per cent of the total applications filed in the world.

“Excerpt from speech delivered by Shri Pranab Mukherjee, President of India on the occasion of the convocation of SIDO KANHU MURMU in April 2013

Source: U21 Rankings of National Higher Education Systems 2012 report, UGC report on higher education India: Strategies and schemes during Eleventh Plan period (2007-2012) or universities and colleges, PresidentofIndia.nic.in , Japan Science and Technology Agency website, Times Higher Education website
Curricula, pedagogy and faculty
Curricula and pedagogy is outdated; institutions face a severe shortage of well-trained quality faculty

1. Curricula and pedagogy

Outdated and irrelevant curricula

“The curriculum in most cases is out-dated and irrelevant since the universities are often not enthusiastic in keeping their curricula up to date and relevant. Teaching-learning practices are mostly examination-oriented with focus on rote learning and memorization.”
- Senior official, Planning Commission

Poor quality of curricula...

“Higher education system in the country is faced with the problems of poor quality of curriculum...”
- Parliamentary panel chaired by Francisco Sardinha, former Chief Minister of Goa, September 2013

Limited choice for students

“Higher education curriculum in India offers little choice for students to study subjects of their own interest due to rigidity in the combinations.”
- Senior official, Planning Commission

2. Faculty

▶ Around 35% of faculty positions in state universities and 40% in central universities are lying vacant
▶ There is no mandatory formal teacher training program conducted to develop effective teaching skills
▶ While enrollment in higher education has grown six times in the last 30 years, faculty strength has only grown four times as reflected in the increasing student-faculty ratio

“The faculty at colleges has limited quality industry experience. The best practice may be to get significant bits of training, at least 25%, to be delivered by actual industry experts”
- Lead Researcher, Tata Institute of Social Sciences (TISS)

“Many colleges have been employing teachers on contract to fill (the) gap... This outsourcing of teaching is hampering the quality of education.”
- A former senior official at UGC while delivering a lecture on “Higher Education in India: New initiatives and new challenges”

Student-faculty ratio (2011-12)

<table>
<thead>
<tr>
<th>Year</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-81</td>
<td>14.2</td>
</tr>
<tr>
<td>1990-91</td>
<td>18.7</td>
</tr>
<tr>
<td>2000-01</td>
<td>20.4</td>
</tr>
<tr>
<td>2010-11</td>
<td>20.8</td>
</tr>
<tr>
<td>2011-12</td>
<td>27.8</td>
</tr>
</tbody>
</table>

Research and partnerships
There is lack of focus on research activity, and the number of high-quality partnerships are limited to only the top institutions in the country

3. Research

- Lack of corporate and inter-institutional linkages, under-resourced higher education institutions and under-qualified faculties have impeded growth of research in India
- India lags behind in publishing research papers; one of the reasons for this being the high teaching load on faculty

“Capacity for doctorate education… is small and has remained stagnant over the past two decades… Low levels of funding, lack of performance culture and segregation of the country’s R&D institutions from universities and colleges have been responsible for this. Even the country’s top universities remain largely teaching focussed with limited research and doctoral education,”
-Senior official, Planning Commission

<table>
<thead>
<tr>
<th>Teaching load per faculty per annum (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIM-A</td>
</tr>
<tr>
<td>Average international standards</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Papers published per faculty per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIT</td>
</tr>
<tr>
<td>MIT</td>
</tr>
</tbody>
</table>

“In 2011, 42,000 patents were filed in our country, compared to over five lakh applications filed each in China and the US in the same year… Talent in academic and research positions in our institutions are difficult to retain due to lack of adequate flexibility in our system.,”
- Excerpt from the speech delivered by Shri Pranab Mukherjee, President of India, at the 10th Convocation at NIT Kurukshetra in April 2013

4. Partnerships

- While the number of academia-academia and academia-industry partnerships are increasing, high quality and deep partnerships are largely limited to the top institutions in India
- UGC issued its guidelines last year, whereby only Indian higher education institutions that have been graded ‘A’ by the NAAC or the NBA are allowed to collaborate with foreign institutions, but only with those that feature among the top 500 global educational institutions

A significant proportion of institutions that enter international academic partnerships are unaccredited, which adversely affects their credibility

<table>
<thead>
<tr>
<th>Type of partnership with international institutions</th>
<th>% of institutions without required approval/affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmatic collaboration</td>
<td>58%</td>
</tr>
<tr>
<td>Twinning</td>
<td>35%</td>
</tr>
<tr>
<td>Others</td>
<td>68%</td>
</tr>
</tbody>
</table>

Source: UGC, Parliamentary standing Committee on human resource development: Report on the foreign educational institutions (Regulation of entry and operations) bill, 2010, PresidentofIndia.nic.in, Higher education institutions websites
Infrastructure and funding
While infrastructure norms are not being met by institutions, public spending on higher education has been stagnant and skewed towards Central institutions.

5. Infrastructure

- In 2008, 48% of universities and 69% of colleges did not meet the criterion of minimum investment in physical facilities and infrastructure.

"It was found that the number of A grade varsities and colleges were less since many of the varsities and colleges lacked proper physical infrastructure and more importantly quality teachers" – Former senior official at UGC while delivering a lecture on “Higher Education in India: New initiatives and new challenges” at Gokhale Institute of Politics and Economics (GIPE)

6. Funding

Public spending on higher education was 1.33% of India’s GDP in FY12. This has been almost flat over the last five years.

UGC grants are skewed towards Central institutions which account for 2.6% of enrollment.

“... almost 95% of the higher education institutions are under the purview of the states ... but it’s the central government institutions that get bulk of the funding” – Ashok Thakur, Secretary Higher Education, GoI

### Governance/Leadership

Several governance-related issues exist in the higher education system, including ambiguity of rules and lack of professional leadership in academic institutions.

#### 7. Governance/Leadership

<table>
<thead>
<tr>
<th>Unfriendly regulations for private players</th>
<th>Lack of professional leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Higher education is the most regulated sector.... All challenges revolve around this...”&lt;br&gt;- Chancellor of a newly established private Indian University</td>
<td>“People besides academia in governance of colleges... Regulations against a for profit organization discourages various investors...Several policies are out of alignment of the overall mission for e.g. taxation issues, student loans, service tax issues... There are standardization issues - quality standards can't be same for institutions offering different courses,”&lt;br&gt;- Chancellor of a newly established private Indian University</td>
</tr>
<tr>
<td>“All type of institutions are measured by the same yardstick... No framework to differentiate and celebrate merit... Unfriendly regulations for corporates opening colleges on non-profit basis...”&lt;br&gt;- Vice Chancellor of a newly established private Indian University</td>
<td>“Governance in Indian Universities is plagued by political battles and micro regulation”&lt;br&gt;- Vice Chancellor of a newly established private Indian University</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Too many regulatory bodies working in isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>“There are 13 regulatory bodies in existence to regulate higher education. Each regulatory body functions in isolation. The regulatory provisions of the various Acts are substantially different from each other since they were created at different periods by different ministries. An over regulated system consisting of multiple agencies tends to increase inefficiency and breed corruption and malpractices...”&lt;br&gt;-Planning Commission Working Group Report 2011</td>
</tr>
</tbody>
</table>

Source: Planning Commission Working Group Report 2011, Primary research by EY
While it is important to address the existing shortcomings in the higher education system, it is more important to move towards a bold and aspirational vision.

<table>
<thead>
<tr>
<th>Current state</th>
<th>Vision 2030 for Indian HE</th>
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<tbody>
<tr>
<td><strong>31 million</strong> enrollment</td>
<td><strong>71 million enrolment</strong></td>
</tr>
<tr>
<td>GER: 22.5%</td>
<td>40 million additional capacity</td>
</tr>
<tr>
<td>Disparity across states (20 percentage points) and social groups</td>
<td>GER: 50%</td>
</tr>
<tr>
<td><strong>Human Development Index:</strong> Ranked 136 amongst 186 countries</td>
<td>Disparity in GER across states reduced to 5 percentage points</td>
</tr>
<tr>
<td>Only 10% of general graduates and 25% of engineers and MBAs are employable</td>
<td><strong>Improved social indicators</strong></td>
</tr>
<tr>
<td>Only 4 Indian institutes in the top 400 universities in the world</td>
<td>Improved health, sanitation, law and order and life expectancy as a result of greater awareness amongst youth</td>
</tr>
<tr>
<td><strong>No institutes in the top 200 in the world</strong></td>
<td><strong>90% of graduates readily employable</strong></td>
</tr>
<tr>
<td><strong>Single largest provider</strong> of global talent</td>
<td><strong>20 Indian universities in the top 200 in the world</strong></td>
</tr>
<tr>
<td><strong>Advanced economic models</strong> at block/district level</td>
<td>Among the <strong>top 5 countries</strong> in terms of research papers and citations</td>
</tr>
<tr>
<td><strong>5-6 Nobel laureates</strong> across categories from the Indian higher education system</td>
<td>Among the <strong>top 5 countries</strong> in terms of number of PHDs</td>
</tr>
<tr>
<td><strong>Regional hub</strong> for higher education, attracting global learners from all over the world</td>
<td></td>
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</tbody>
</table>

*EY estimates
### Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>AICTE</td>
<td>All India Council for Technical Education</td>
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<tr>
<td>BBA</td>
<td>Bachelor of Business Administration</td>
</tr>
<tr>
<td>BITS</td>
<td>Birla Institute of Technology and Sciences</td>
</tr>
<tr>
<td>BoM</td>
<td>Board of Management</td>
</tr>
<tr>
<td>BP</td>
<td>British Petroleum</td>
</tr>
<tr>
<td>BPO</td>
<td>Business Processing Outsourcing</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compounded Annual Growth Rate</td>
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<tr>
<td>CASI</td>
<td>Center for the Advanced Study of India</td>
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<tr>
<td>EBD</td>
<td>Educationally backward Districts</td>
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<td>ERP</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>FICCI</td>
<td>Federation of Indian Chambers of Commerce and Industry</td>
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<tr>
<td>FY</td>
<td>Financial Year</td>
</tr>
<tr>
<td>GAR</td>
<td>Gross Attendance Ratio</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GER</td>
<td>Gross Enrollment Ratio</td>
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<tr>
<td>GIPE</td>
<td>Gokhale Institute of Politics and Economics</td>
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<td>HE</td>
<td>Higher Education</td>
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<tr>
<td>HEI</td>
<td>Higher Education Institution</td>
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<tr>
<td>HKUST</td>
<td>Hong Kong University of Science &amp; Technology</td>
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<tr>
<td>HMCT</td>
<td>Hotel Management and Catering Technology</td>
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<td>HRD</td>
<td>Human Resource Development</td>
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<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
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<tr>
<td>IGNOU</td>
<td>Indira Gandhi National Open University</td>
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<td>IHS</td>
<td>Information Handling Services</td>
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<td>IICs</td>
<td>Inter-institution Centers</td>
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<td>IIM</td>
<td>Indian Institute of Management</td>
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<td>ISc</td>
<td>Indian Institute of Science</td>
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<td>IISER</td>
<td>Indian Institute of Science Education and Research</td>
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<tr>
<td>IIT</td>
<td>Indian Institute of Technology</td>
</tr>
<tr>
<td>ISB</td>
<td>Indian School of Business</td>
</tr>
<tr>
<td>INR</td>
<td>Indian National Rupee</td>
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<tr>
<td>INSPIRE</td>
<td>Innovation in Science Pursuit for Inspired Research</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
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<td>ITI</td>
<td>Industrial training Institute</td>
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<tr>
<td>KVPY</td>
<td>Kishore Vaigyanik Protsahan Yojana</td>
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<tr>
<td>LMS</td>
<td>Learning Management System</td>
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<tr>
<td>LPU</td>
<td>Lovely Professional University</td>
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<td>MBA</td>
<td>Masters of Business Administration</td>
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<tr>
<td>MHRD</td>
<td>Ministry of Human Resource and Development</td>
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<td>MIB</td>
<td>Masters of Business Administration</td>
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<td>MIT</td>
<td>Massachusetts Institute of Technology</td>
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<tr>
<td>MPLS</td>
<td>Multiprotocol Label Switching</td>
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<td>MOOCs</td>
<td>Massive Open Online Courses</td>
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<td>MoU</td>
<td>Memorandum of Understanding</td>
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<td>National Knowledge Functional Hub</td>
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<td>National Knowledge Network</td>
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<td>National Mission on Education through ICT</td>
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<td>RMIT</td>
<td>Royal Melbourne Institute of Technology</td>
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<td>RUSA</td>
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<td>R&amp;D</td>
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<td>SC</td>
<td>Scheduled Caste</td>
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<td>ST</td>
<td>Scheduled Tribe</td>
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<td>Shiv Nadar University</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>UKIERI</td>
<td>UK India Education and Research Initiative</td>
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## Acknowledgements

<table>
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<tr>
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<th>Institution</th>
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<tbody>
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<td>Dr. Upinder Dhar</td>
<td>Vice Chancellor, JK Lakshmipat University</td>
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<tr>
<td>Dr. Vinod Shanbhag</td>
<td>Academic Advisor, Pearl Academy of Fashion</td>
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</tbody>
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Team

EY team

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Keshav Kanoria
Saadat Ali
Bhavna Pruthi

FICCI team

Shobha Mishra Ghosh
Sunita Mohan
Rajesh Pankaj
Nikhil Sharma
About FICCI

Established in 1927, FICCI is the largest and oldest apex business organization in India. Its history is closely interwoven with India's struggle for independence and its subsequent emergence as one of the most rapidly growing economies globally. FICCI plays a leading role in policy debates that are at the forefront of social, economic and political change. Through its 400 professionals, FICCI is active in 70 sectors of the economy. FICCI's stand on policy issues is sought out by think tanks, governments and academia. Its publications are widely read for their in-depth research and policy prescriptions. FICCI has joint business councils with 79 countries around the world.

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For more information please log on to http://www.ficci-hes.com

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Our services
We provide end-to-end solutions to suit the requirements of clients from all segments of the industry. The following is a snapshot of our services:

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<th>Pre-entry</th>
<th>Establishment</th>
<th>Growth</th>
<th>Stability</th>
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<td>► Market landscaping</td>
<td>► Business planning</td>
<td>► Growth strategy</td>
<td>► Business process improvement</td>
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<td>► Marketing strategy</td>
<td>► International expansion strategy</td>
<td>► Strategic cost management</td>
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<td>► Project management</td>
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<td>► Expatriate taxation</td>
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<td>► Valuation and business modeling</td>
<td>► Representation before Indian statutory and fiscal authorities</td>
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<td>► Fund raising and M&amp;A advisory</td>
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<tr>
<th>City</th>
<th>Address</th>
<th>Phone Numbers</th>
<th>Fax Numbers</th>
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<tbody>
<tr>
<td>Ahmedabad</td>
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<td>Tel: +91 79 6608 3800</td>
<td>Fax: +91 79 6608 3900</td>
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<td>NCR</td>
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<td>Bengaluru</td>
<td>12th &amp; 13th floor &quot;U B City&quot; Canberra Block No.24, Vittal Mallya Road Bengaluru-560 001 Tel: +91 80 4027 5000 +91 80 6727 5000 Fax: +91 80 2210 6000 (12th floor) Fax: +91 80 2224 0695 (13th floor)</td>
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<td>9th Floor “ABAD Nucleus” NH-49, Maradu PO Kochi - 682 304 Tel: +91 484 304 4000 Fax: +91 484 270 5393</td>
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<td>Mumbai</td>
<td>14th Floor, The Ruby 29 Senapati Bapat Marg Dadar (west) Mumbai-400 028, India Tel: +91 22 6192 0000 Fax: +91 22 6192 1000</td>
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EYIN1303-XXX
ED 06/01/2014

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