

Higher education in India: Moving towards global relevance and competitiveness

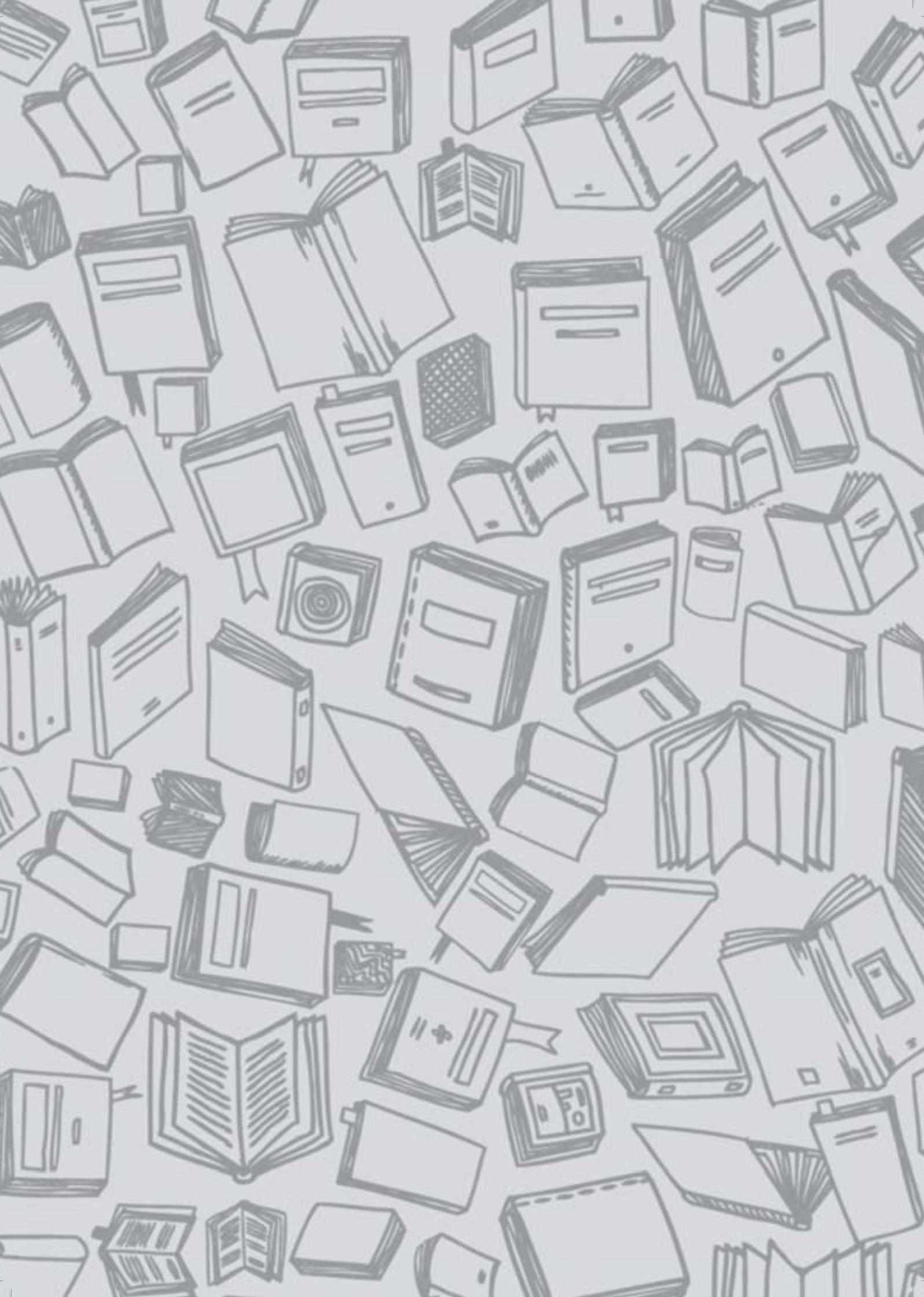
FICCI Higher Education Summit 2014

The EY logo consists of the letters 'EY' in a bold, grey, sans-serif font. The 'E' and 'Y' are connected at the top and bottom. The background of the entire page is a blurred stack of books in various colors (red, green, blue, yellow) on a wooden shelf. A yellow diagonal shape is overlaid on the right side, and a grey striped pattern is on the left side.

EY

Building a better
working world





Contents

Foreword	4
Executive summary	7
Need for a globally relevant and competitive higher education system	8
Assessment of current state of the Indian higher education system	13
Vision for becoming globally-relevant and competitive	27
Learnings from globally relevant and competitive higher education systems and institutions	29
Recommendations for the Government and higher education institutions	61
Annexure	68
About FICCI's work in higher education	70
About EY's Education Sector practice	71
Acknowledgements	72
Glossary	73

Foreword

Although education has been a priority sector almost close to a decade, somewhere there has been negligible will to bring in much change in the system. Prime Minister Modi's independence day declaration of 'Make in India' has in a sense articulated India's aspirations to be a global leader in the near future. We at FICCI, believe that this dream can be achieved only if there is an alignment of vision for skill development, higher education and research with the overall economic agenda.

In this context, 'FICCI Vision 2030 for Higher Education in India' released last November during 9th FICCI Higher Education Summit, has been timely and appropriate. The Vision clearly outlines the architecture that would create a high quality, yet equitable and affordable Indian higher education system that is not just the best in the world but the best for the world.

The FICCI-EY report this year is very much aligned to the Vision 2030 articulated last year and focuses on making Indian higher education globally relevant and competitive. The paper highlights key actions needed by the government and higher educational institutions & universities to make India an Education hub endowed with globally-relevant talent that would feed into creating a vibrant research, innovation and entrepreneurship ecosystem. The report also describes case studies of certain key countries and institutions that have successfully developed innovative solutions to become Centres of excellence in higher education.

Last but not the least, we would like to take this opportunity to thank everyone in the government, higher education sector and industry who have contributed to bring in the insights in the report. We are also grateful to Ministry of HRD, Government of India, and all partners and sponsors for their support in organising the FICCI Higher Education Summit 2014 titled "Higher Education 2030: Making It Happen" on November 13 & 14, 2014 in FICCI, New Delhi. We are convinced that the recommendation from this report and the conference, if implemented in its true spirit will help us in achieving the aspirations of 1.25 billion population.



Rajan Saxena
Co-Chairman,
FICCI Higher Education Committee



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



Avinash Vashista
Co-Chairman,
FICCI Higher Education Committee

Foreword

Dear readers,

The global economy is undergoing structural transformation, with increased shift towards services and capital-intensive manufacturing from labor-intensive manufacturing and agriculture. In India too, services and manufacturing will dominate the economy. Innovation will need to drive the next phase of economic growth. Multinational enterprise will flourish. The Indian Prime Minister, in his Independence Day speech, referred to “Make in India”, which will encourage international players to set up manufacturing bases in the country. These global and domestic economic changes will require a significantly increased number of sophisticated workers, innovators, and thinkers who can thrive in a globally-connected, technologically-advanced world. While India is well-positioned to cater to the changes in labour market requirements—given its large workforce and projected labour surplus—it would not realize the benefits of its demographic dividend unless it hones the global competence and skills of its graduates and workforce.

In last year’s EY-FICCI report, “Higher Education in India - Vision 2030”, we articulated the vision for the Indian higher education system as one which is not just best in the world, but also best for the world. This year, we have taken this theme forward to explore how Indian higher education system can be made more “globally relevant and competitive” in terms of: creating globally-reputed institutions, attracting international students, faculty and institutions, becoming a hub for globally-fit talent, and building a culture of research, innovation, and entrepreneurship to enable high economic growth. While we appreciate that for ‘Foundation’ institutions, focus on local priorities must continue: providing a well-rounded education to India’s masses and imparting skills that are relevant to the local industry and community, ‘Career-focused’ and ‘Research-focused’ institutions must embrace internationalization wholeheartedly.

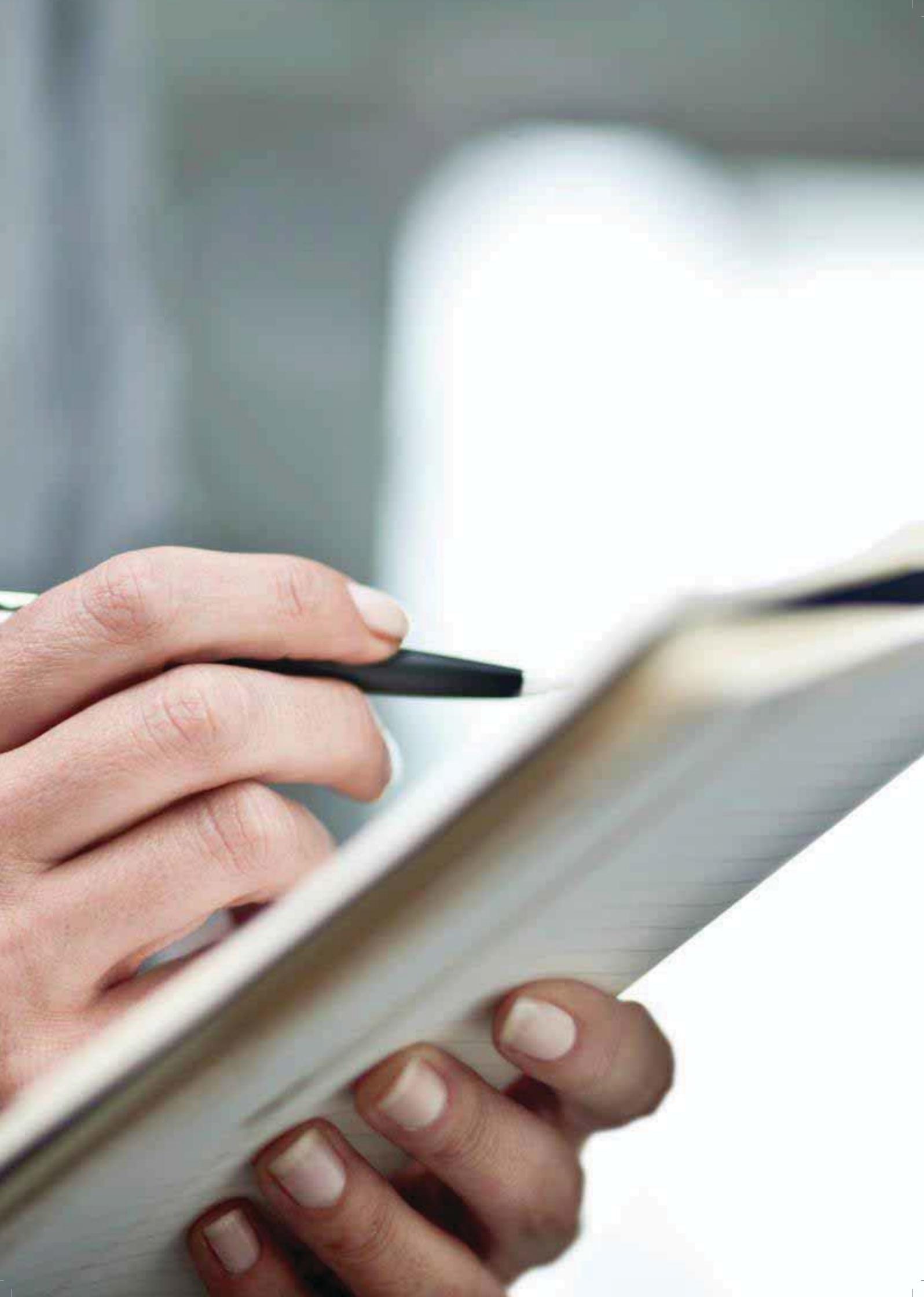
This report examines the current state of the system through the lens of “global relevance and competitiveness” and identified impediments that are hindering progress. It also profiles the best practices of countries and institutions that we consider globally relevant and competitive. Subsequently, it proposes measures that key stakeholders, i.e. Government, industry and institutions, could take to make the Indian higher education system truly globally relevant and competitive.

We hope you enjoy reading the report



Nikhil Rajpal

Partner and Education Sector Leader, Ernst & Young LLP



Executive summary

The global economy is undergoing structural transformation: there will be need for a workforce of 3.3 billion by 2020, increasingly in the services and capital intensive-manufacturing sectors. The phenomena is also expected to play out in India - by 2020, 90% of India's GDP and 75% of employment is expected to be contributed by the services and manufacturing sectors. Technological advancement will make several jobs redundant while also creating new job roles. This structural shift in employment will increase demand for sophisticated workers, innovators, and thinkers who can thrive in a globally-connected and dynamic economy. India, with its large workforce and increasing pool of higher education graduates, is strategically positioned to reap the benefits of this shift. However, the 'demographic dividend' will be squandered unless India is able to create a "globally relevant and competitive" higher education system that serves the requirements of both the domestic as well as global economy.

We believe that "globally relevant and competitive" in the Indian context implies the following:

- ▶ **India prominently placed on the global higher education map** in terms of more globally-reputed Indian institutions, significant student and faculty mobility, presence of / collaborations with quality international institutions
- ▶ **India as a hub for talent** that is able to drive competitiveness of the Indian economy and is fit to work in or serve international markets
- ▶ **A culture of research, innovation and entrepreneurship** that can power high economic growth in the country

While the Indian higher education system has made considerable progress in terms of capacity creation and enrolment especially in the last decade, it lags significantly in terms of "global relevance and competitiveness". We believe the key gaps are as follows:

- ▶ **Low employability of graduates**, driven by several factors including outdated curricula, shortage of quality faculty, high student-teacher ratios, lack of institutional and industry linkages, and lack of autonomy to introduce new and innovative courses.
- ▶ **Low impact research output and patents filed** given relatively low government and corporate spending on research, insufficient doctoral students, missing research focus and culture in most institutions, and lack of international research collaborations
- ▶ **Limited focus on entrepreneurship** on campus as reflected in the fact that there are few institutes that offer programs in entrepreneurship and have active incubation / entrepreneurship cells
- ▶ **Complex regulatory requirements and hurdles**, poor institutional governance standards, and lack of professional management

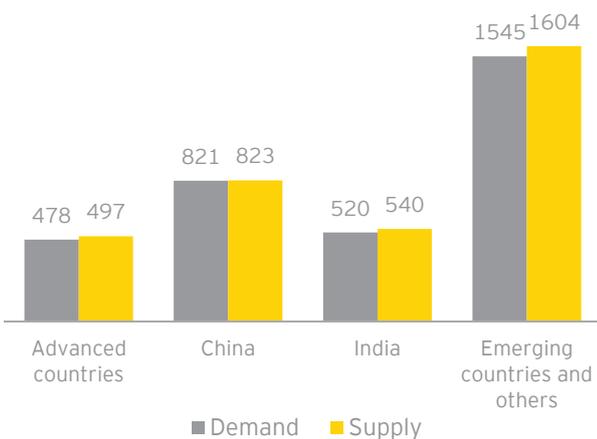
While we acknowledge that the Government has proposed and is also taking several measures to improve the system on the above aspects, there are some steps it could take to make the Indian higher education system a role model for other emerging systems. Institutions, on their part, would need to adopt a transformative and innovative approach across all levers of higher education: from curricula and pedagogy to the use of technology to partnerships, governance and funding, to become globally relevant and competitive. In this report, we have looked at some world-class institutions and country systems that could hold important lessons for government and institutions.

Structural shifts in global economy, productivity enhancement and technological progress are driving demand for highly skilled workers, innovators and knowledge workers

Globally, 3.5 billion jobs are expected to be created by 2020 and the demand for highly skilled labor is projected to outpace that for low-skilled workers

The advanced economies, China and India are likely to drive demand for labor by 2020

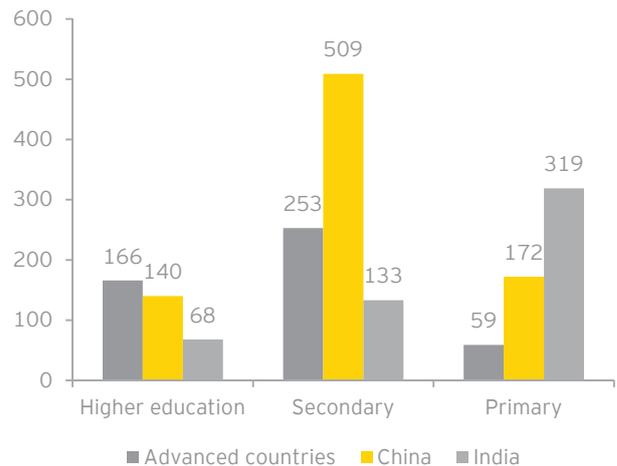
Global labor force demand and supply by 2020 (in million)



Source: McKinsey Global Institute "The world at work- Jobs, pay and skills for 3.5 billion people"

This will require the greater part of the workforce to have appropriate educational qualifications

Breakdown of demand for labor by level of education by 2020 (in millions)



Source: McKinsey Global Institute "The world at work- Jobs, pay and skills for 3.5 billion people"

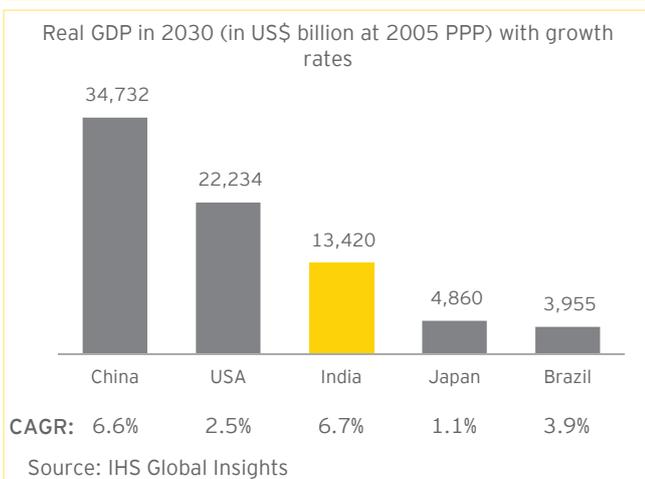
- ▶ The US and other advanced countries are expected to witness the highest job growth in services including healthcare and business services. These are knowledge-intensive sectors that require highly skilled workers.
- ▶ Job growth in China is likely to shift from labor-intensive manufacturing to capital-intensive manufacturing and services.
- ▶ Most sectors are replacing mass labor with a boutique, high-tech workforce.

- ▶ The demand for highly skilled college graduates is expected to increase around the world, e.g., demand for Science Technology Engineering and Mathematics (STEM) graduates in the US is expected to increase at a CAGR of 1.8% between 2008-2018; Since the current supply of domestic STEM graduates will not be sufficient for the US to meet this demand.
- ▶ Shortage of highly skilled workers with a tertiary level of education is expected to reach 18 million by 2020 globally. This is likely to be largely met by higher tertiary enrolments, the increased women participation in the workforce and an increase in the retirement age of workers.

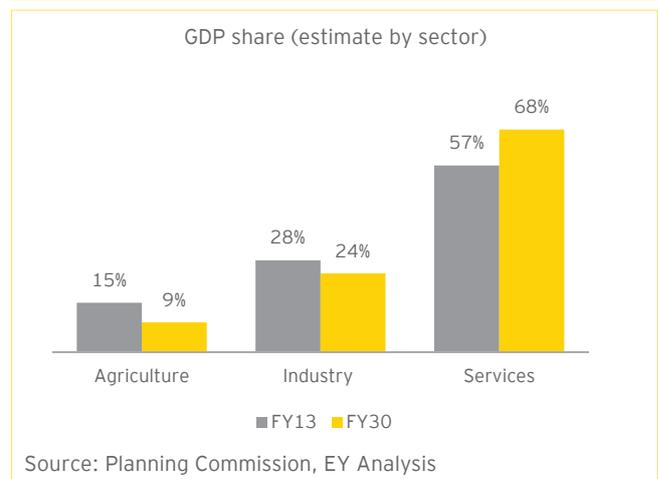
Source: McKinsey Global Institute, Jeremy Rifkins

Economic growth and employment in India should also continue to shift toward the manufacturing and services sectors

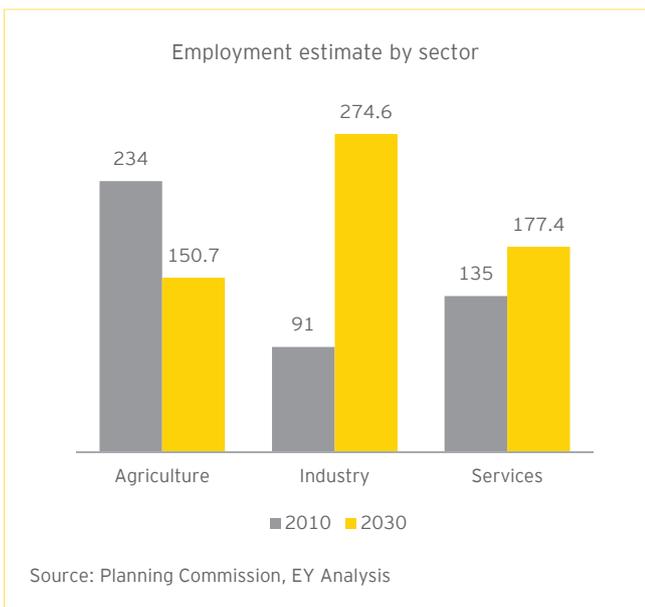
India is expected to be the third largest-economy in the world by 2030



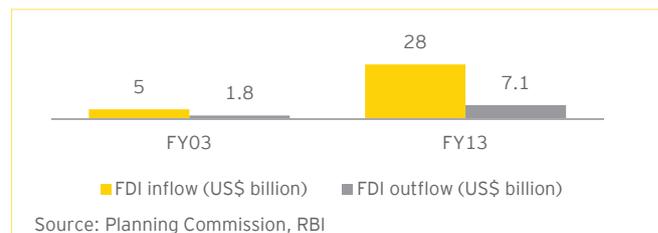
Skill-intensive industries such as manufacturing and services are expected to contribute more than 90% of India's GDP by 2030



The focus of employment is expected to shift towards services and manufacturing



FDI, both inbound and outbound, has increased dramatically since 2003 and is primarily concentrated in the manufacturing and services sectors



- ▶ The Tata and Reliance groups generate more than 60% and the Mahindra & Mahindra, Aditya Birla and Adani groups more than 40% of their revenue from abroad.
- ▶ Outbound investments such as those by Infosys, TCS and Wipro come under the category of services.
- ▶ The Prime Minister's initiative, "Make in India," is expected to attract and encourage foreign enterprises to invest in India
- ▶ Large FDI projects such as those set up by POSCO and BP are in the manufacturing sector.

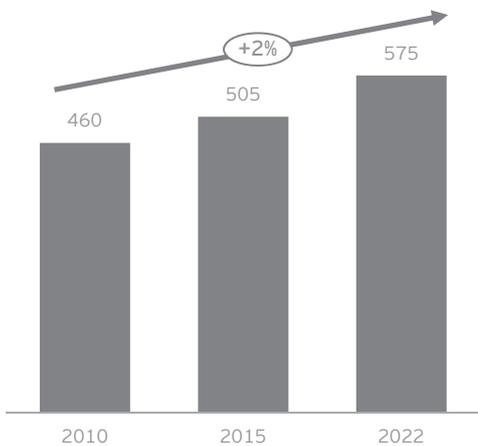
There is an urgent requirement for a highly skilled and innovative workforce to cater to the rising need for labor in manufacturing and services as well as to cater to multinational enterprises. There is also an imperative need for research and innovation to achieve high growth levels.

India is well-positioned to cater to the changing requirements of the labor market in domestic and international markets due to favorable demographics and large output of higher education graduates

India will have a large labor force by 2022.

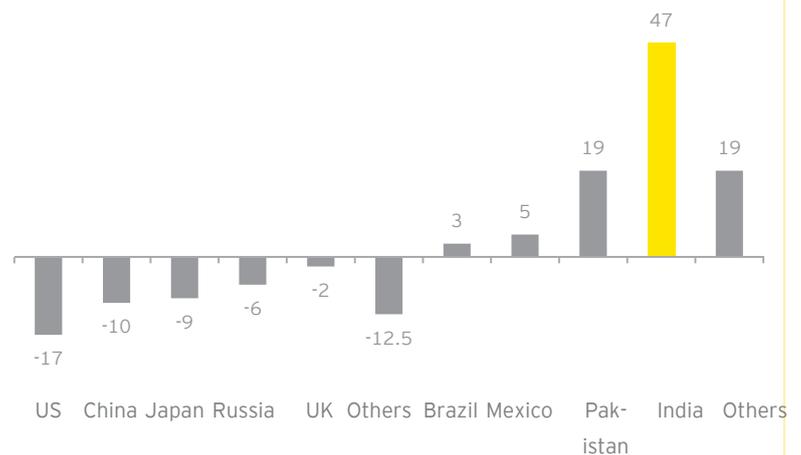
India's significant demographic dividend is expected to not only power the country's growth, but also enable it to become the global hub for talent.

Requirement for labor (in million)



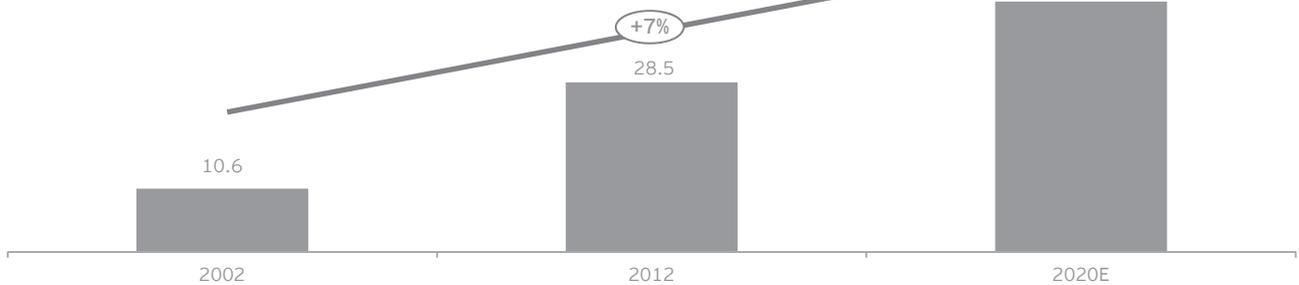
Shortfall and surplus of labor by 2020 in different countries (in million)

By 2020, ageing of world economies is expected to create a significant shortage of skilled manpower of around 56.5 million, while India alone will have a labour surplus of 47 million.



India is expected to produce a significant number of HE graduates in coming years.

Higher education enrolments in India (in millions)



To realize India's demographic dividend, there is a need for the creation of a globally relevant and competitive HE system that can produce competent graduates.

There is need for creating a three-faceted globally relevant and competitive higher education system



In the next section, we have analysed where Indian HE currently stands on the three facets mentioned above



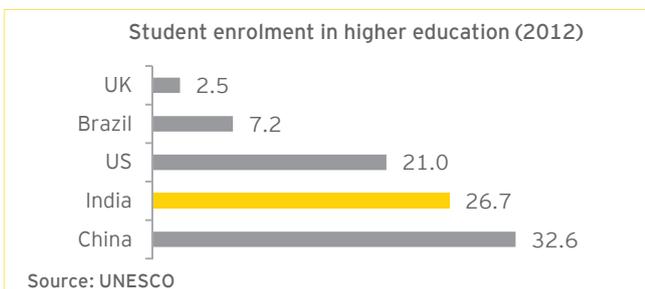
**Assessment of current state of the
Indian higher education system**

1. India prominently placed on global higher education map

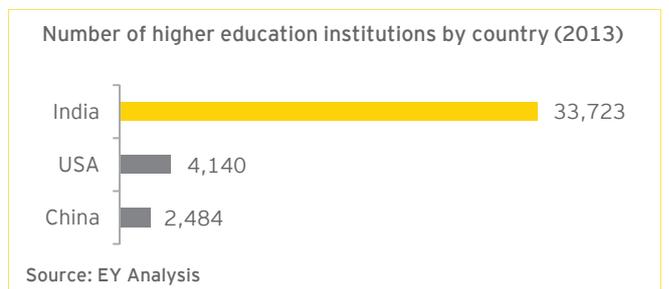
While India has the largest number of HEIs, only a handful feature in global rankings

A Globally reputed Indian HEIs

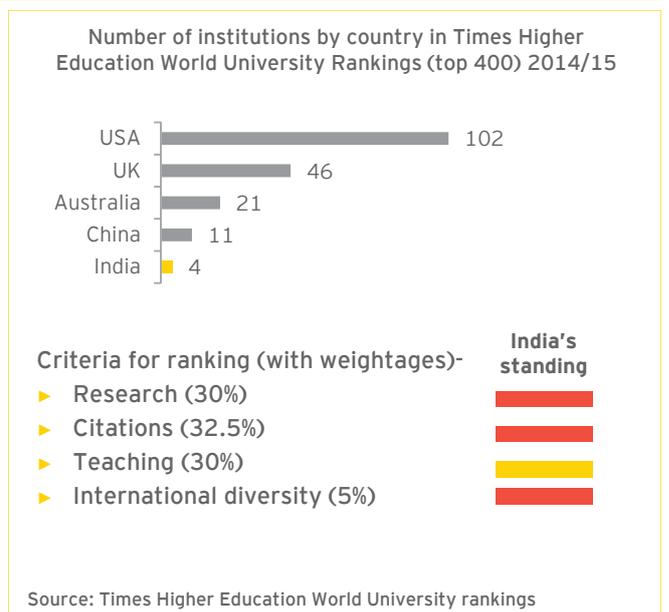
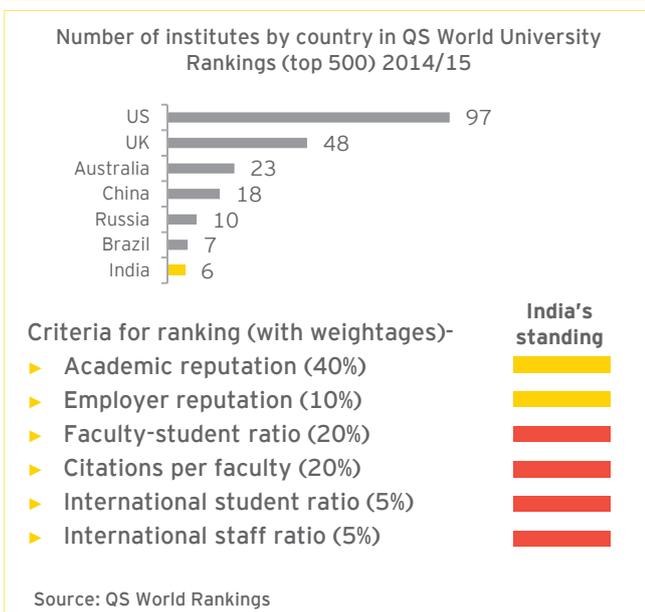
While India has the second highest HE enrolment in the world...



..and also has the largest number of higher education institutes in the world...



...only a few Indian HE institutions are globally ranked



*Yellow signifies moderate position while red specifies that India lags behind its peers

Furthermore, only a handful of Indian B-schools have global accreditations such as AACSB, AMBA and EQUIS.

The major reasons for poor performance of Indian institutions in reputed global rankings are as follows:

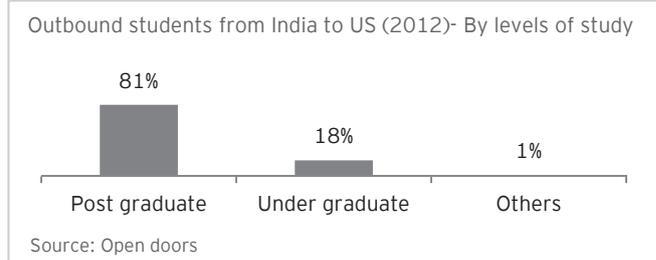
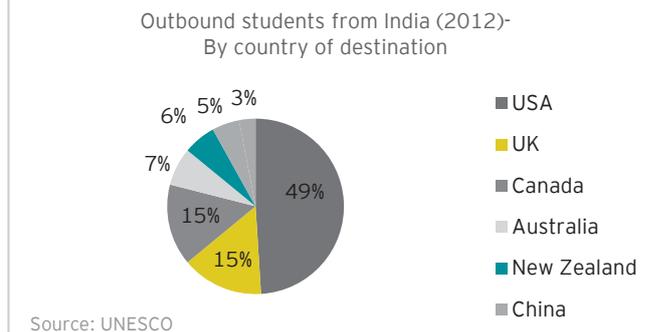
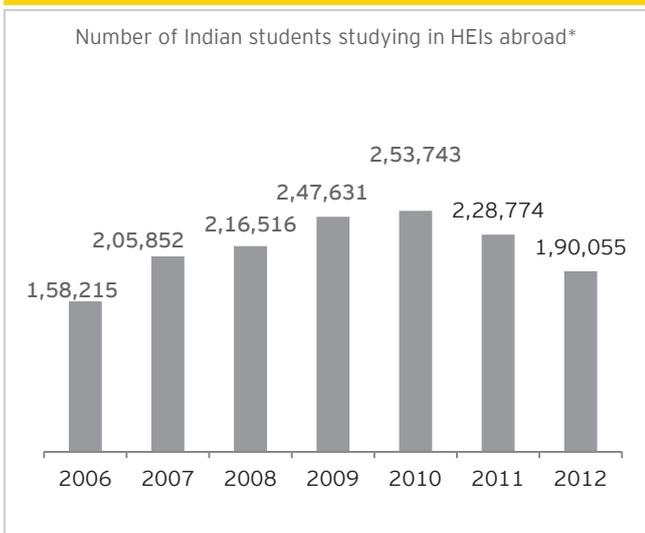
- ▶ Major global rankings place significant weightage on research. Most Indian institutions lag behind in research and citations and therefore tend to perform poorly in these rankings.
- ▶ Limited number of PhDs and only a few international collaborations have led to low ranking of Indian institutions.
- ▶ Rankings are not a priority for most Indian institutions. Consequently the required attention is not paid to this as is amply evident from their limited participation and partial information provided by Indian HEIs.
- ▶ Most India HEIs have a restricted international outlook.

1. India prominently placed on the global higher education map

A significant number of Indian students go abroad, seeking quality education; moreover, incoming foreign students are limited in number

B Student mobility

A large number of Indian students are going abroad to study in foreign HEIs



Drivers for Indian students going abroad

Higher salaries/Student ROIs

- ▶ International placements
- ▶ Immigration
- ▶ Quality of life

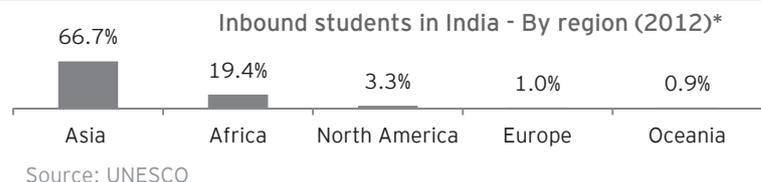
International exposure

- ▶ International faculty
- ▶ International student mix
- ▶ Exposure to global industry

Aspiration to study in top ranked global universities

- ▶ World-class research and faculty

In 2012, 31,000 foreign students came to India to study in the country's higher education institutions.



Foreign students from developing countries come to India primarily for the following reasons:

- ▶ Better job prospects and immigration opportunity
- ▶ Opportunity to learn English
- ▶ Diversity and allure of Indian culture.

Foreign students from developed countries do not come to India primarily due to the following reasons:

- ▶ Few high ranked institutes
- ▶ Poor perception of education offered by Indian HEIs
- ▶ Lifestyle compromise
- ▶ Limited high quality placements

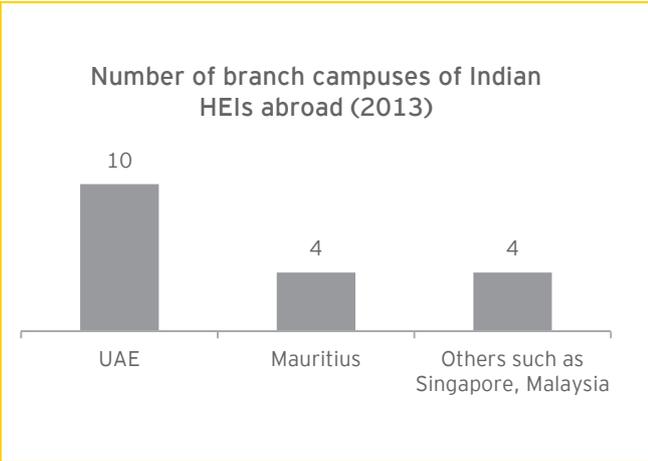
*These figures do not include students who come to India on exchange programs

1. India prominently placed on the global higher education map

Few Indian institutions have set up campuses abroad, the phenomenon is relatively nascent

C Indian institutions with campuses abroad

Indian HE institutions have very few international campuses



- Examples of institutions with campuses abroad:
- ▶ BITS (1 campus in Dubai)
 - ▶ Manipal (6 campuses in Dubai, Nepal, Antigua and Malaysia)
 - ▶ SPJIMR (3 campuses in Dubai, Singapore and new one being set up in Sydney)
 - ▶ IMT (1 campus in Dubai)
 - ▶ Amity (10 campuses in the US, Romania, Abu Dhabi, Dubai, London, Singapore, New Jersey, Mauritius and China)
 - ▶ IIT Delhi setting up research center in Mauritius in collaboration with Mauritius University

Case 1: BITS Pilani

- ▶ BITS has a campus in Dubai, which has around 1,500 students from 20 different countries. It offers first degrees, higher degrees and doctoral programs in engineering including chemical, mechanical and electronics engineering
- ▶ It offers various flexible first degree programs including dual degree ones, second semester admission, transfers across programs and admission with advance standing

Case 2: Manipal Group

- ▶ Manipal Group has campuses in Dubai, Nepal, Malaysia, and Antigua
- ▶ Its Dubai campus was set up in September 2000 and is located in Dubai International Academic City. It has more than 1,400 students from 20 countries. These are enrolled in various Bachelors, Masters, and Certificate Programs
- ▶ Manipal entered joint venture with Govt. of Nepal for its campus in the country and JVMC Corporation for its campus in Malaysia to provide medical education
- ▶ In 2008, it acquired the University of Antigua where it offers medical education

Although Indian HEIs are setting up campus abroad, these are still limited in number for the following reasons:

- ▶ Low brand recognition: Due to their limited brand recognition in abroad, India's HEIs are unable to attract high-quality students to them
- ▶ Poor quality perception: Indian HEIs are perceived as offering lower quality education compared to their global counterparts
- ▶ High cost of setting up campuses: Setting up campuses abroad is not a commercially viable option for several Indian HEIs given the high capital expenditure involved

1. India prominently placed on the global higher education map

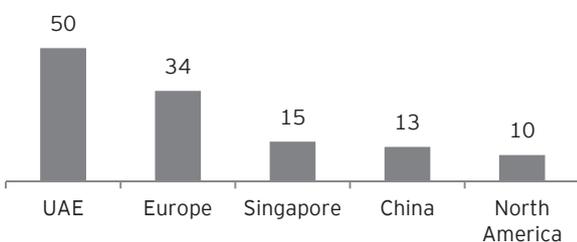
Global institutions have refrained from setting up campuses in India due to unfavourable regulations. They are instead opting for the executive education and research centre route

D

Participation of foreign HEIs in India

Foreign HEIs have not set up branch campuses in India as yet because of the challenging regulatory environment in the country. However, some are waiting on the sidelines e.g. LSE, Georgia Tech and Virginia Tech

Comparison of international branch campuses in different countries (2011)



Source: International Centre for Higher Education Management University of Bath, UK

Major US universities such as Carnegie-Mellon University (CMU), New York University (NYU) have campuses in Middle East, while CMU, Duke University, Johns Hopkins and NYU are some of the top American universities that have campuses in China

Reasons for FEIs opting to set up branch campuses in China and Middle East

- ▶ Financial support from host government through incentives including cash and land grants, and tax breaks
- ▶ Significant operational autonomy
- ▶ Access to high-quality students and faculty

Reasons for FEIs not opting to set up branch campuses in India

- ▶ FEIs not being allowed to repatriate surplus income to home country and needing to maintain minimum corpus of INR25 crore
- ▶ Lack of academic, operational and financial autonomy

Some reputed FEIs have partnered with local players to offer full-fledged programs or have opted for the executive education/research route, which is not mired in regulations

Foreign and joint programs with local partners

- ▶ Schulich School of Business, York University, offers a global MBA dual degree in collaboration with GMR group
- ▶ GD Goenka World Institute offers engineering and management degrees from Lancaster University
- ▶ Indian School of Business (ISB) offers a co-certified program in management with Kellogg, Wharton and London Business School
- ▶ The Mahindra Group and Ecole Centrale, a prestigious French university, offer dual degree program in engineering based out of their campus in Hyderabad

Executive education and research

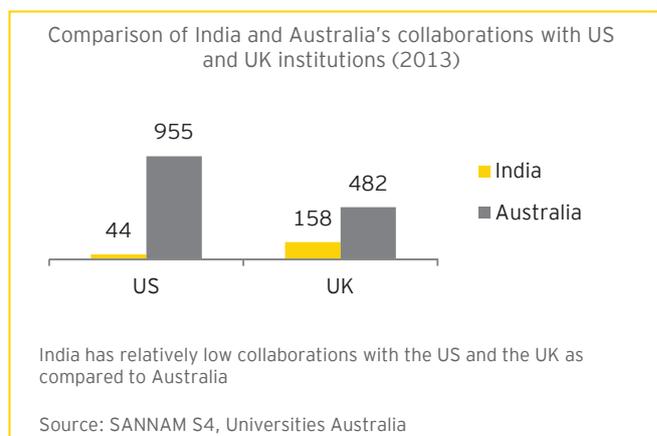
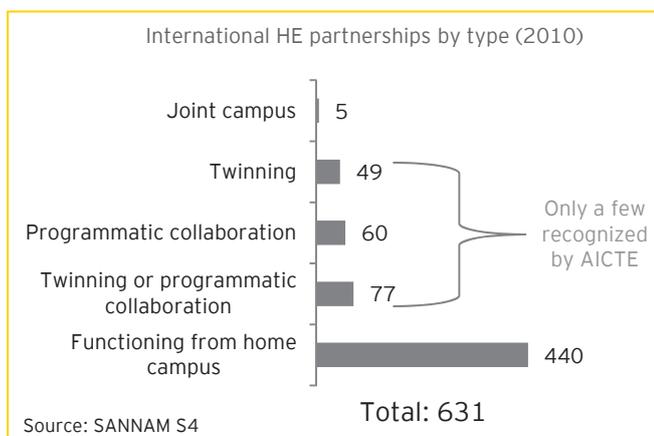
- ▶ India Research Centre (IRC) set up by the Harvard Business School in 2006, conducts research and short-term executive education programs in India that are specific to sectors/industries or companies since 2008
- ▶ The INSEAD offers its Leadership Program for senior Indian executives with its Indian program partner Eruditis
- ▶ Wharton offers an Accelerated Development Program, in collaboration with Eruditis, for business leaders in India
- ▶ The Richard Ivey School of Business has a case development centre at the ISB in India. It also offers executive education

1. India prominently placed on the global higher education map

Deep collaborations are also limited in number

E Collaboration between Indian and foreign HEIs

Indian HE partnerships are mainly characterized by student and faculty exchange and are few in number



Examples of international collaborations

Research projects	Faculty/ Student exchange	Curriculum development	Twining arrangements
<ul style="list-style-type: none"> ▶ OP Jindal with the University of Michigan (USA) and Griffith University (Australia) for joint research in law ▶ Indian Institute of Technology, Mumbai and Monash, Australia ▶ Indian Institute of Science and University of Leicester for joint research on smart and adaptable air-vehicles 	<ul style="list-style-type: none"> ▶ Signing of MOU between Apeejay Stya University in Haryana with Georgia College, USA and EM Normandie, France for student exchange program ▶ NIILM University, Haryana has student exchange tie-up with Massachusetts (MIT) and University of Virginia (UVA) ▶ OP Jindal and Cornell University for student and faculty exchange 	<ul style="list-style-type: none"> ▶ Punjab Technical University and Carnegie Mellon University have entered into a partnership for curriculum development ▶ MIT assisted BITS with curriculum development 	<ul style="list-style-type: none"> ▶ Shiv Nadar University and Carnegie Mellon offer a dual degree engineering program ▶ OP Jindal collaborates with University of Arizona and International University College, Turin (Italy) for law programs

International HEIs have low number of collaborations with Indian HEIs due to following reasons

- ▶ Approval from various agencies including UGC, AICTE needed to form a collaboration with Indian HEIs.
- ▶ International HEIs face various academic difficulties while managing collaborations with Indian HEIs.
- ▶ Poor governance even if restricted to curriculum development and lack of professional management in Indian HEIs act as barrier.

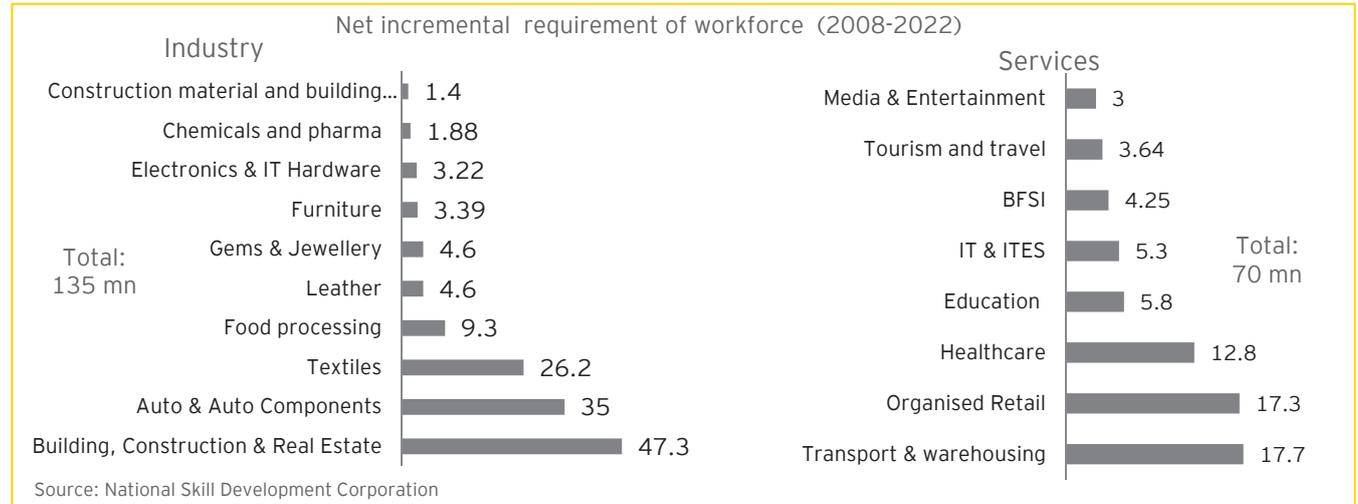
* Refers primarily to student and faculty exchange collaborations

2. India as a talent hub

While there is expected to be a surplus supply of higher education graduates vis-à-vis industry's requirement in coming years...

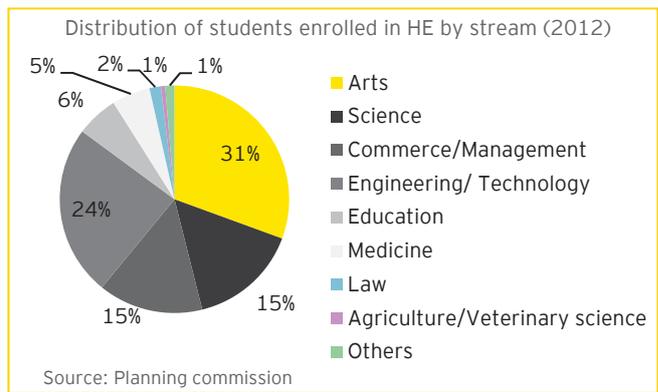
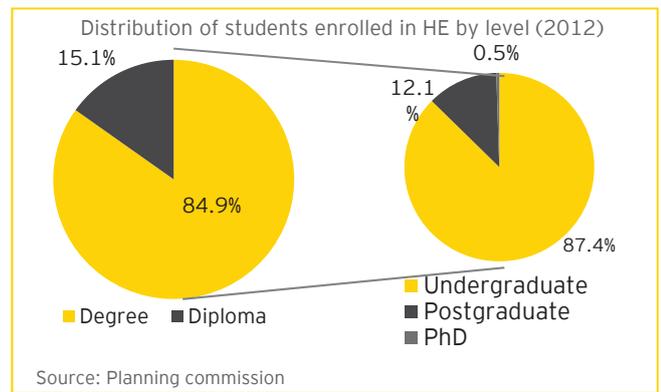
A Employability in India

Demand for HE graduates



- ▶ Net incremental workforce required in industry and services sectors by 2022: ~200 million
- ▶ Gross incremental requirement for manpower: ~250 million (given retirement/drop-out rate)
- ▶ Total gross incremental requirement for graduates/postgraduates in the workforce (Organized + Unorganized) is 75 million (30% of gross incremental requirement)
- ▶ Annual incremental requirement for HE graduates: 5-6 million

Supply of HE graduates

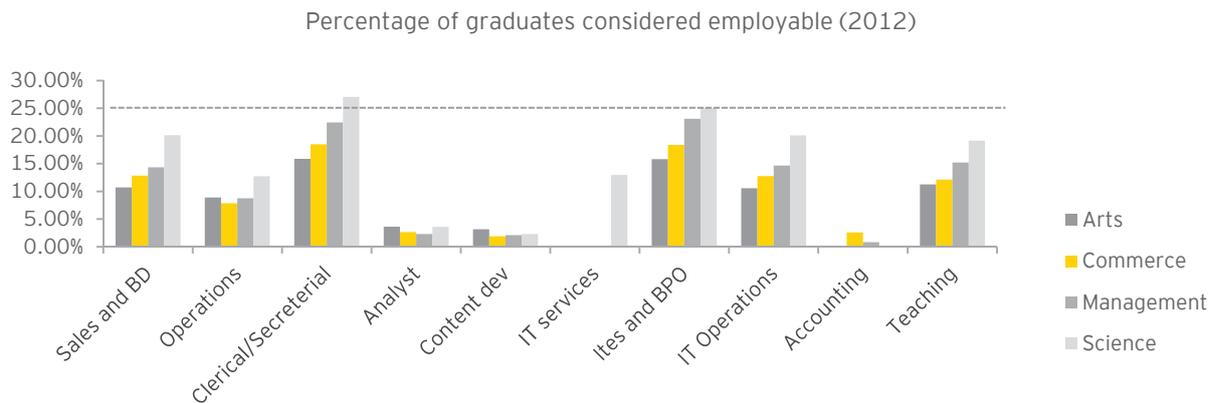


- ▶ Enrolment in higher education institutions (2011-12): 25.9 million
- ▶ Estimated enrolment in 2022: ~45 million
- ▶ Average course duration: 3.2 years
- ▶ Therefore, average number of HE graduates every year : 10-11 million

While there is an over-supply of graduates, some will not voluntarily join the workforce or will take employment in agriculture, be self-employed, or go abroad

2. India as a hub for talent ...employability of graduates is low

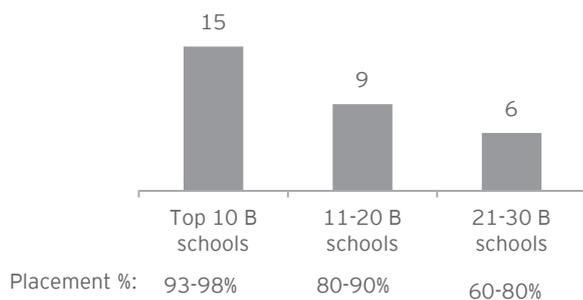
Only a small proportion of Indian graduates are considered employable



Source: Aspiring Minds, National Employability Report 2013

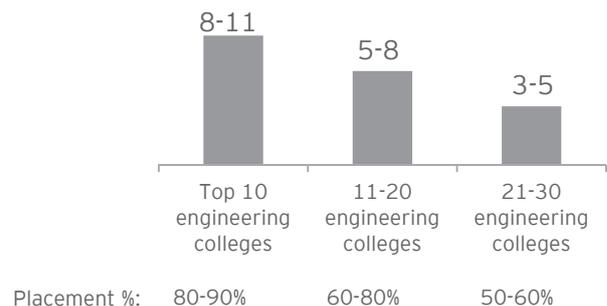
This reflects in the fact that placement outcomes drop significantly as we move away from top tier institutions

Comparison of average salaries (INR lakh) and placement % of B-schools



Source: College websites

Comparison of average salaries (INR lakh) and placement % of engineering colleges



Source: College websites

This is also resulting in closing down of lower rung HEIs that are not able to deliver high-quality outcomes

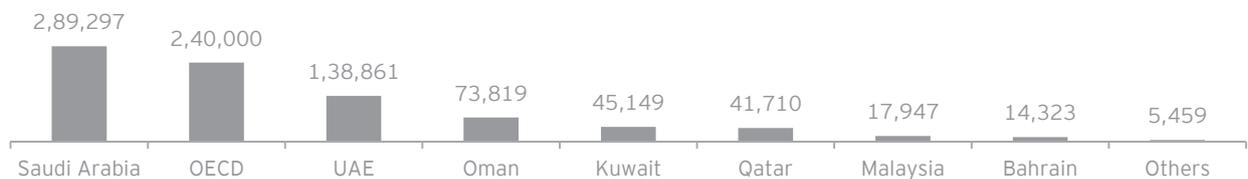
- ▶ In 2012, 32 engineering and management colleges stopped admitting students. Among those that closed down were 5 engineering, 9 MBA, 14 MCA, 3 pharmacy and 1 PGDM college
- ▶ As many as 120 colleges, including 94 management institutes across the country, are expected to be closed in 2014 because of their inability to fill the seats

2. India as a hub for talent

International employment of Indian talent is concentrated at the lower end

B Employability in international market

In 2011, 866,565 people officially migrated from India, with 70% of these going to Middle East

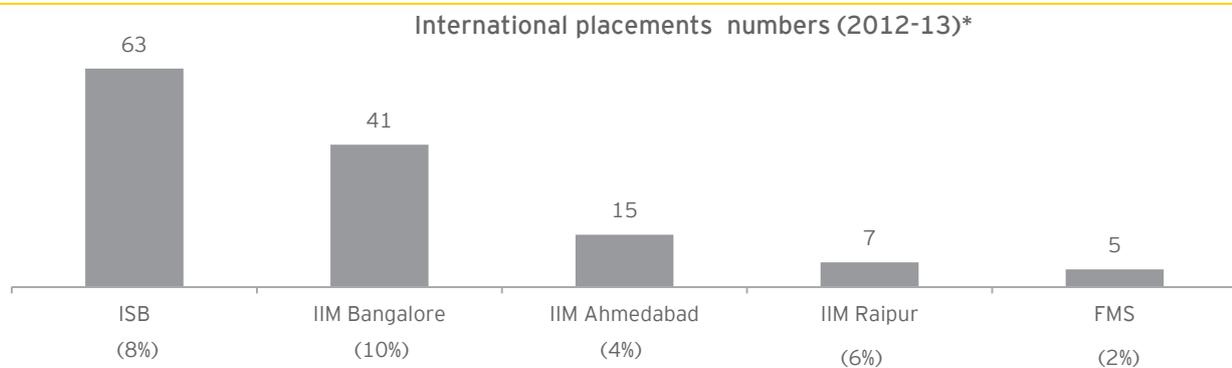


Source: Ministry of Indian Overseas Affairs, OECD report "Labor Migration, Skills & Student Mobility in Asia"

The majority of the migrants are engaged in low-skilled, blue-collar work

- ▶ **GCC:** Around 80% of Indian labor engaged in Gulf Cooperation Countries work in construction operations and maintenance jobs. This group includes a large share of unorganized labour working as agricultural farm labourers, housemaids and drivers
- ▶ **EU:** In the EU, Indian labor works as caretakers of children and the elderly, in hospitality services, retail sector, as cleaning and maintenance workers and also in agriculture-related and construction-activities. The UK and Germany are emerging as destinations for white collar jobs including legislators, senior officials, managers and professionals
- ▶ **Australia:** Indian labor in Australia mainly works as cooks, software and applications programmers, in the ICT business and as systems analysts
- ▶ **US:** Around 80% of Indian labor in the US works in managerial, technical, sales and administrative jobs

Only a handful of talent from top Indian B-schools is placed abroad



Source: College websites

* Number in bracket indicates percentage of internationally placed students out of total batch size

2. India as a hub for talent

Unemployability is driven by several factors including irrelevant and outdated curricula, shortage of high-quality faculty, few academia-industry linkages, and a limited focus on developing soft/workplace skills

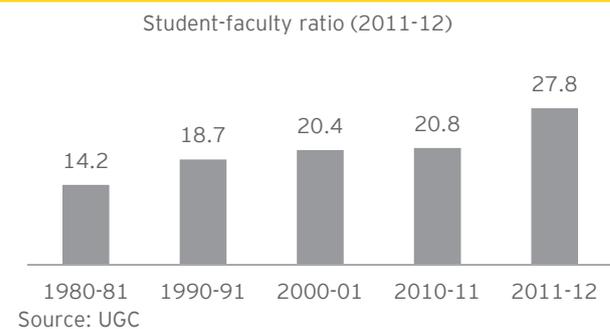
Outdated curricula

"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

"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

Shortage of faculty and high student-faculty ratio

- ▶ Around 35% of faculty positions in state universities and 40% in central universities are lying vacant
- ▶ While enrolment in higher education has grown 6 times in the last 30 years, faculty strength has only grown 4 times as is amply reflected in the increasing student-faculty ratio
- ▶ The student-faculty ratio in the US and China is 13.6 and 16.8 respectively

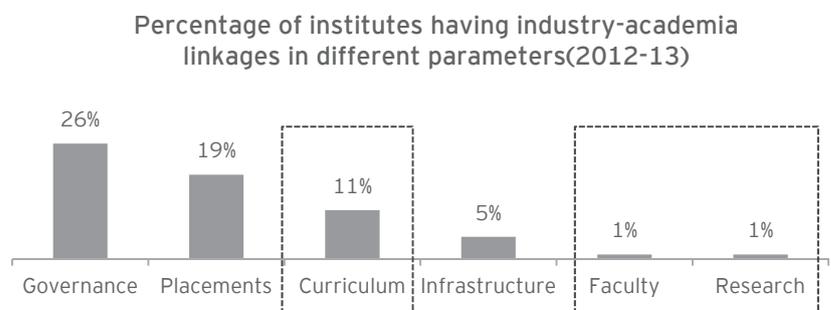


"The faculty at colleges has limited quality industry experience. The best practice may be to get significant bits of training, at least 25%, to be delivered by actual industry experts"
 - Lead Researcher, Tata Institute of Social Sciences (TISS)

"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"

Weak industry-academia linkages

- ▶ A survey was conducted by CII in collaboration with AICTE on a sample size of 1050 engineering and management institutes with the objective of mapping the industry linkages of AICTE-approved technical institutions in India.
- ▶ Industry-academia linkages are greater in parameters such as governance and placements and low in programmatic collaborations.
- ▶ Only 5% of institutes have any support from industry in infrastructure



Source: AICTE

Limited value addition since there is dearth of program-level collaborations for faculty, research and curriculum

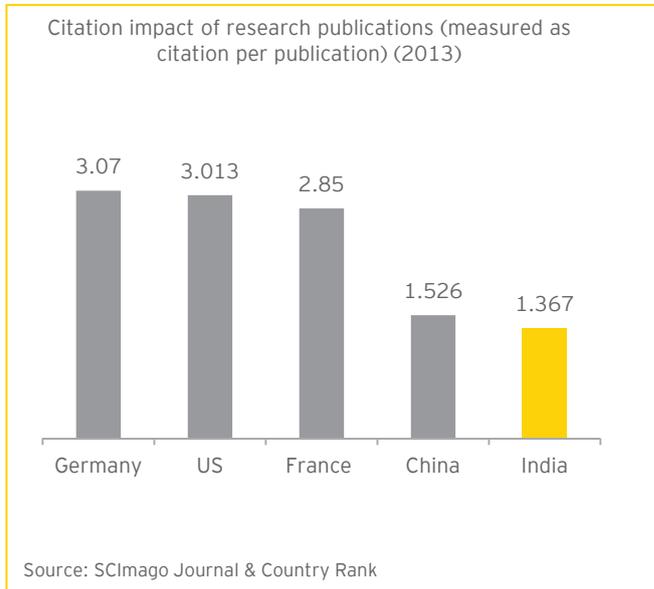
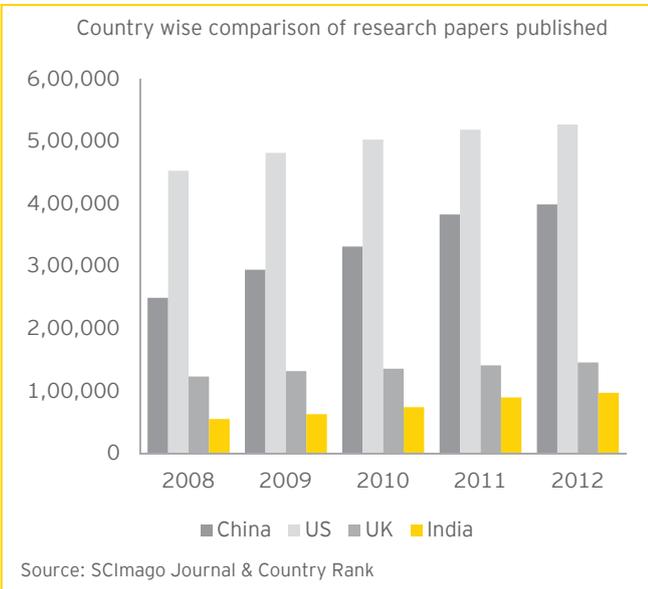
3. Culture of research, innovation and entrepreneurship

Research publications from India significantly lag behind those of other countries, as do the country's patent filings

A Research publications and their impact; patent filings

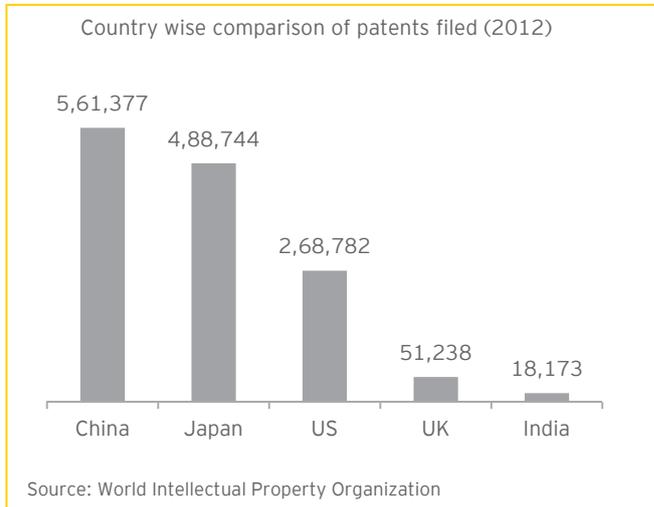
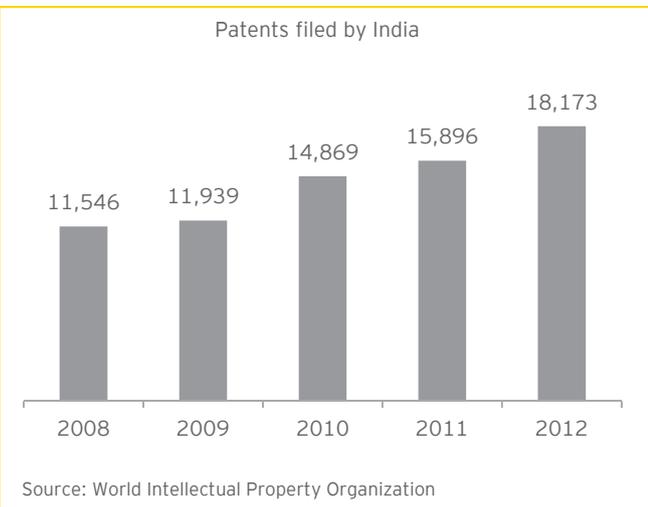
While the number of research papers published in India has increased continuously for the past few years, it still significantly lags behind that released in other countries

The quality of Indian research papers is suspect, as reflected in low citation impact



Patents filed by India have grown at a CAGR of 12% from 2008 to 2012...

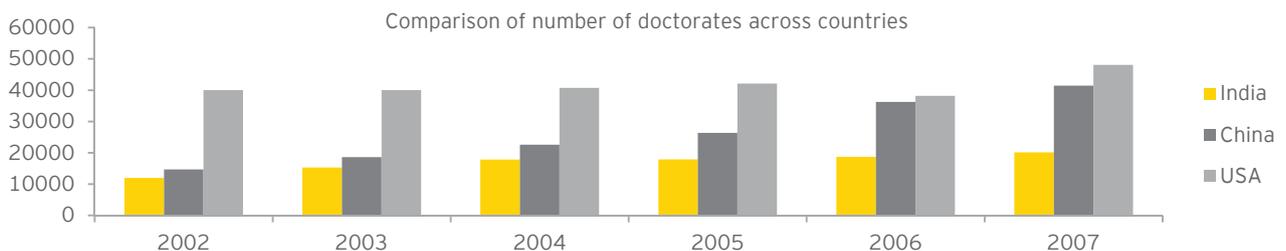
...But, these numbers are small compared to patents filed by countries such as the US and China



3. Culture of research, innovation and entrepreneurship

This is driven by several factors including low output of PhDs, limited and skewed government funding, and lack of international research collaborations

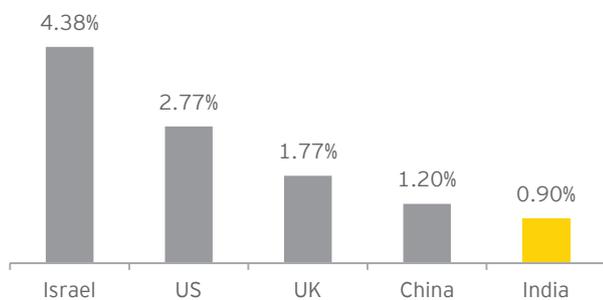
India produces fewer doctorates than other countries, which limits the number of patents it files



Source: MHRD and CII report on Annual Status of Higher Education of States and UTs in India- 2013

The Indian Government spends only 0.9% of its GDP on R&D

Research spending as % of GDP (2011)

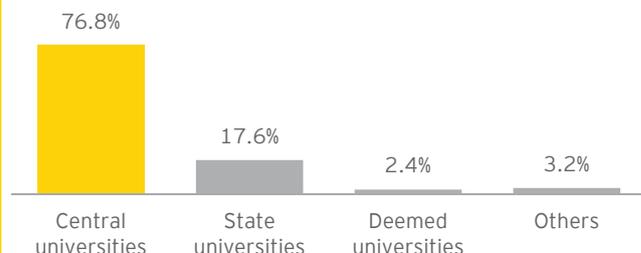


Source: OECD

In the HE sector, UGC grants which include research grants are skewed toward Central institutions, which account for 2.6% of enrolment

UGC grants (as percentage of total grants) to different kinds of universities (2011-12)

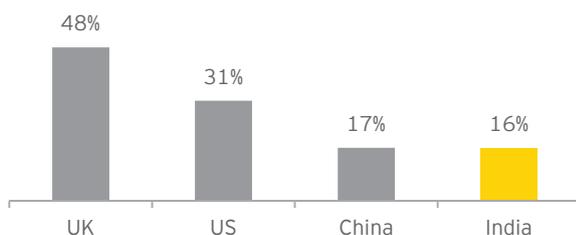
Total grants: INR66.78 billion



Source: UGC

India lacks international collaborations and published joint research papers

Percentage of research papers published with international collaboration (2013)



Source: SCImago Journal & Country Rank

Higher focus on teaching rather than research by universities is also limiting the research potential of the country

"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,"

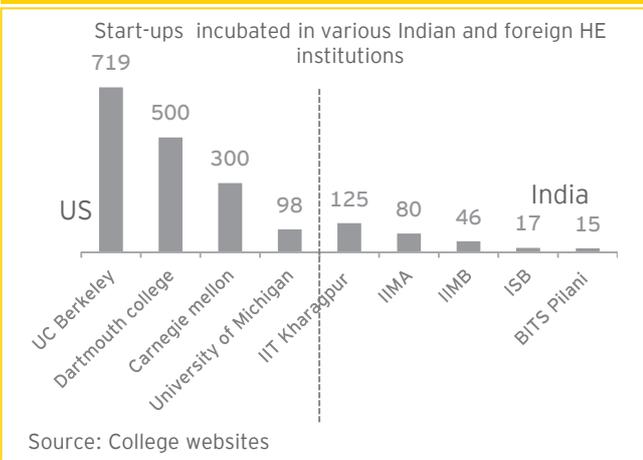
-Senior official, Planning Commission

3. Culture of research, innovation, and entrepreneurship

Entrepreneurial culture on the campuses of Indian HEIs is still evolving, since the start-up ecosystem including incubation centres, venture-funding and governmental support is still at its early stages

B Entrepreneurship

The number of start-ups incubated in Indian institutions are limited in number, compared to the US



Incubation centers are a relatively recent phenomenon in Indian HEIs

Year of establishment of tip tier Indian institutions

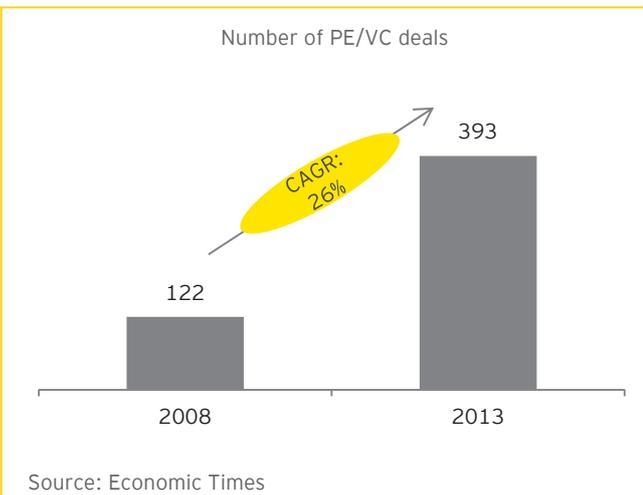
Institute	Incorporation year
IIM Ahmedabad	2002
IIM Bangalore	2002
Indian School of Business	2001
IIT Bombay	2004
IIT Madras	2006
BITS Pilani	2005
National Institute of Design	2004
Anna university	2001

Source: College websites

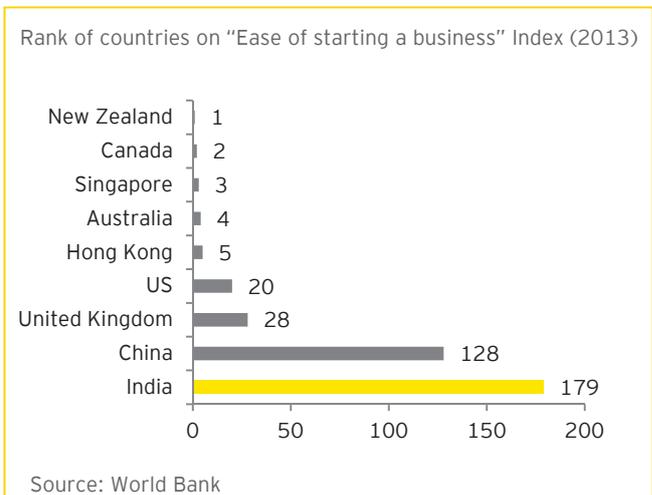
Lack of entrepreneurship programs in Indian HEIs

- ▶ Only a few Indian HEIs offer entrepreneurship programs.
- ▶ Most of these have only recently started these entrepreneurship programs e.g. IIT-Delhi recently introduced courses on entrepreneurship, IIT-Kharagpur is considering a micro specialization in engineering entrepreneurship for its B.Tech students from next year.

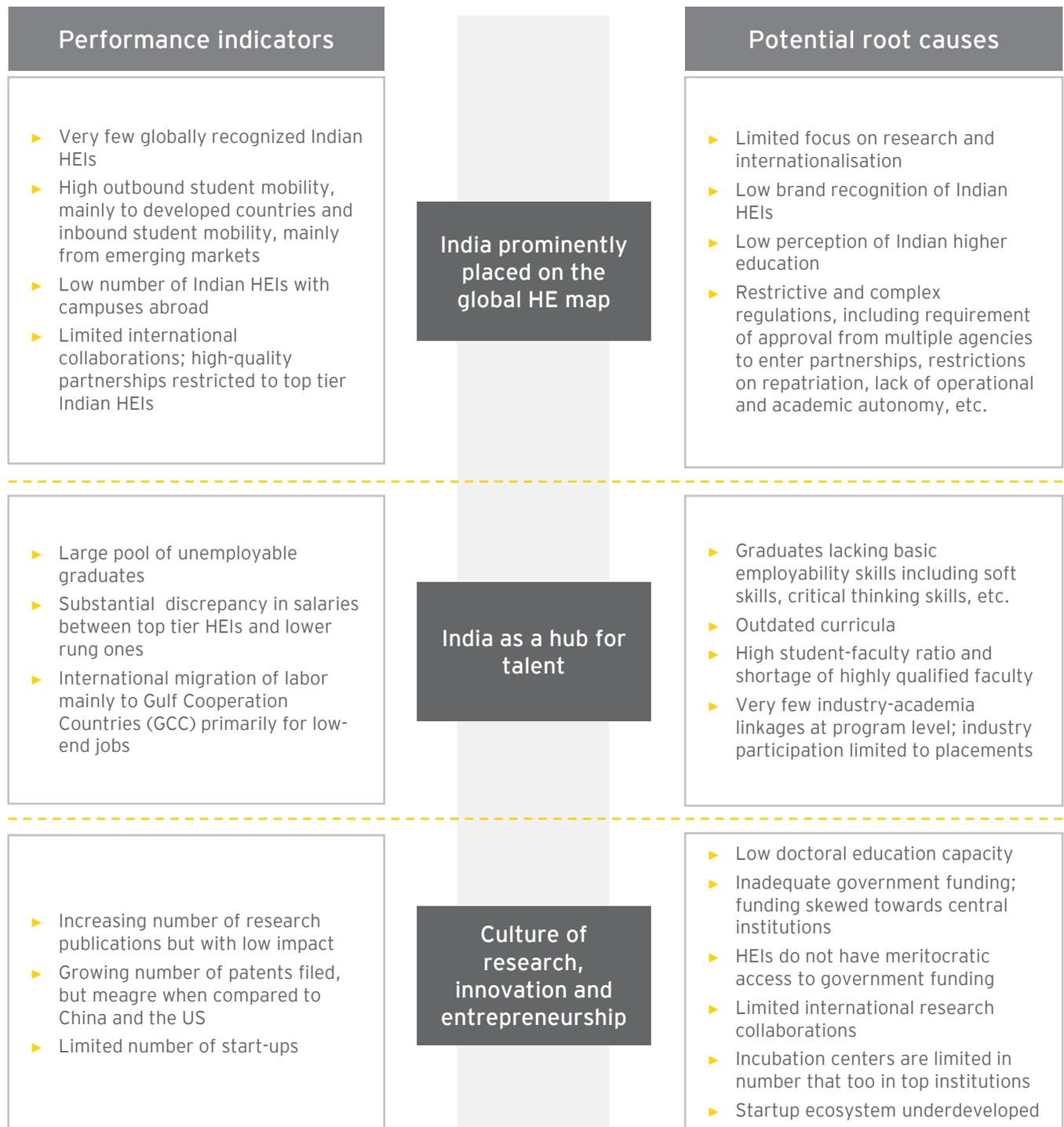
India's start-up/growth funding ecosystem has recently developed, as indicated by few deals witnessed. Moreover, angel investing /accelerators are a new phenomenon



India ranks 179th on the "Ease of starting a business" Index



Summary: assessment of current state of the Indian higher education system





**Vision for becoming globally-relevant
and competitive**

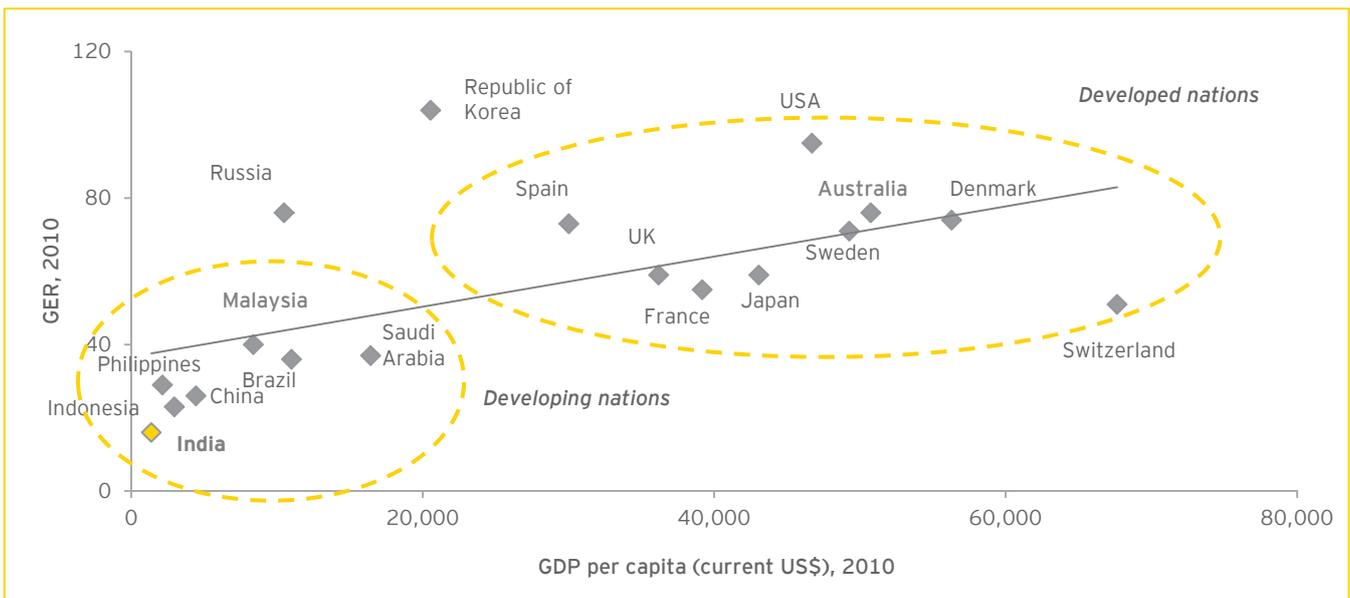
The vision is to build a 21st century model for higher education that is of high-quality, yet equitable and affordable, and be exemplary of a higher education system that is not just the best *in* the world but the best *for* the world

In this section, we propose some aspirational targets and key imperatives for Indian HE system to become globally relevant and competitive

	Aspect	Proposed targets (2030)	Key imperatives to realize these targets
India prominently placed on the global HE map	Globally recognized HEIs	20+ HEIs in global top 200 rankings	Developing HEIs with international outlook and global impact
	Student and faculty mobility	<ul style="list-style-type: none"> ▶ 500,000 international students in India; significant proportion from developed countries ▶ 5% international faculty in Indian HE system 	Providing world-class teaching, research and conducive learning environment
	Transnational education	<ul style="list-style-type: none"> ▶ 2 million+ students in Indian campuses abroad ▶ 20+ HEIs among world's top 200 with strategic/significance presence in India 	Relaxing complex regulatory requirements; incentivizing transnational education
India as a hub for talent	Employability	90% graduates readily employable	Developing skilled, job-ready and productive graduates
	Supply of labor to global markets	Single-largest provider of global talent	Enabling higher education graduates with global skills, who can be employed by or serve workforce-deficient countries
Culture of research, innovation and entrepreneurship	Research	<ul style="list-style-type: none"> ▶ Among top 5 countries in terms of research papers and citations ▶ Among top 5 countries in terms of number of PhDs ▶ 5-6 home grown Nobel laureates 	Developing research-focused universities that deliver high-quality research output and research-focused graduates
	Innovation	Among top 5 countries in terms of patent filings	Increasing R&D funding by Government; promoting increased industry participation in research and innovation
	Entrepreneurship	Amongst the leading countries in terms of incubation on HE campuses	Creating a conducive educational, financial and regulatory ecosystem to promote entrepreneurship

We have analysed countries that have built globally relevant and competitive higher education systems to understand key enabling factors

Country-wise GER and GDP per capita comparison



Countries selected basis:

- ▶ Significant presence in / positive movement in global rankings in the last decade
- ▶ Research output and quality
- ▶ Position on Global Innovation Index (GII)
- ▶ Position on Entrepreneurship Monitor (GEM) standing



(selection validated by industry experts)

Emerging HE systems

1. South Korea
2. China
3. Singapore

Traditionally strong HE systems

4. US
5. UK

1. South Korea

Overview and initiatives

Overview

Parameter	1990-2000s	Recent
HE Overview		
Population	43 mn (1990)	50 mn
HE enrolment	1.6 mn (1990)	3.7 mn
HE GER	33% (1990)	103% (2010); highest in the world
HEIs	265 (2000)	376
Positioning on the global HE map		
Globally ranked institutions (Times)	3 (2005)	6 (2013)
International students	16,832 (2004)	89,537 (2011)
Hub for talent		
Employment %	88%	97%
Culture of research, innovation and entrepreneurship		
Research output	2,500 publications (1995)	32,000 publications (2009)
Global Innovation Index	GII World rank 19 (2006-07)	GII World Rank 16 (2014)
Entrepreneurship Monitor	TEA (total entrepreneurial activity) rating of 15 (2001)	TEA rating of 14.5% (2012)- among the highest in the world



1. South Korea

Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
A. Positioning on the global HE map		
Incheon Free Economic Zone	<ul style="list-style-type: none"> ▶ Incheon Zone founded in 2003 ▶ Key objective to attract 100,000 foreign students by 2012 	<ul style="list-style-type: none"> ▶ State University of New York (SUNY) started a campus in 2012 ▶ George Mason University, University of Utah, and Ghent University (Belgium) are opening campuses in 2014 ▶ Yonsei University from Seoul opened a 'Global Campus' in Songdo ▶ 10 foreign institutions planned by 2019 ▶ 2,487 U.S. students in Korea in 2011, up from 522 in 2001 ▶ 5,000 foreign academics with PhDs employed in Korea's HE sector
B. Hub for talent		
Korean Government's Youth Employment Quota System	<ul style="list-style-type: none"> ▶ To increase youth employment in the public sector 	<ul style="list-style-type: none"> ▶ Increase in number of youth employed in public institutions from 6,866 (2.4%) persons in 2010, to 8,929 (3.0%) persons in 2011, and 9,857 (3.3%) persons in 2012
K-Move, K-Move mentor group and K-Move schools	<ul style="list-style-type: none"> ▶ Government support for youth who want to tap the overseas recruitment market 	<ul style="list-style-type: none"> ▶ Provided youth access to overseas jobs after educating them for 6-12 months
Supporting youth employment in the private sector	<ul style="list-style-type: none"> ▶ Government operating 'Employment Academy for the Youth' which helps businesses connect with youth for employment ▶ Youth Internship Program for SMEs: Information on SMEs is provided to young job seekers through 'Worknet' 	<ul style="list-style-type: none"> ▶ In 2013, 2,726 businesses, 181 universities, and 40 regular high schools participated in the Youth academy. In proportion, SMEs and university from non-metropolitan areas take account for 89% and 62%, respectively ▶ Number of SMEs providing information on system as of July 2013- ~10,000

Source: OBHE; Statistics Korea, Economically Active Population Survey Employment and labour policy in Korea, 2013; OECD Reviews of Innovation Policy Industry and Technology Policies in Korea, 2012

1. South Korea

Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
C. Culture of research, innovation, and entrepreneurship		
World Class University (WCU) project in 2008	<ul style="list-style-type: none"> ▶ USD600 mn funding ▶ Objective to attract international scholars and Nobel laureates to collaborate with Korean faculty in science and technology over five years 	<ul style="list-style-type: none"> ▶ Applications from more than 1,000 foreign researchers (including 400 from the U.S., with almost 350 having been selected over the program's two phases) ▶ 11 Nobel laureates, 12 members of the U.S. National Academy of Science and 18 members of the U.S. National Academy of Engineering lectured or conducted research in Korea under the program.
Brain Korea 21 (1999-2012)	<ul style="list-style-type: none"> ▶ Provision of Brain Korea 21 grants to improve quality of research among young faculty members and enhance qualifications of job-seekers ▶ The Republic of Korea spends 4.36% of its GDP on R%D, the highest in the world 	<ul style="list-style-type: none"> ▶ Korea's addition to the Science Citation Index (SCI) indexed academic papers increased from 1,615 in 1999 to 4,250 in 2005. In 2007, there were 25,494 papers listed in SCI ▶ Smaller but high-performing research universities—POSTECH and KAIST—received government-initiated performance-based funding and competition grants ▶ Korea's Global Innovation Index (GII) rank improved from 21 in 2012 to 18 in 2013 and 16 in 2014* ▶ Korea also tops the high income economies in the GI index in placing 'Education as a human aspect of innovation'***
Korean government's 'My Work Project for Youth' in 2010	<ul style="list-style-type: none"> ▶ Nurturing 4,000 young social entrepreneurs and start-ups 	<ul style="list-style-type: none"> ▶ Korea has a TEA (total entrepreneurial activity) rating of 14.5% as per the Global Entrepreneurship Monitor 2012, among the highest in the world ▶ Compared to other OECD countries, Korea shows a relatively high level of necessity-driven entrepreneurship (35%)

***based on parameters such as School life expectancy years, PISA scales in reading-maths, & science, Pupil-teacher ratio- secondary, Tertiary enrolment- % gross, Tertiary inbound mobility %, Researchers headcounts/mn pop., Average score top 3 universities, Firms offering formal training % firms.*

**This can be attributed to the Output sub-index and closing gap between inputs and outputs and improving Innovation efficiency ratios.*

Source: OBHE; World Education News and Reviews ; The Global Innovation Index 2014

2. Singapore Overview and initiatives

Overview

Parameter	2000s	Recent
HE Overview		
Population	3.2 million (1990)	5.4 million
HE enrolment	Polytechnics: 56,044 Universities: 37,648 (2000)	Polytechnics: 80,900 Universities: 57,117
HEIs	6 (2000)	26 HEIs including 12 junior colleges, 5 polytechnics, 3 ITE campuses, 2 art schools and 4 autonomous universities (in 2014)
HE expenditure as % of GDP	3.6%	3.3%
Positioning on the global HE map		
Globally ranked institutions (Times)	2 (2005)	2 (2013)
International students	NA	50,000
Hub for talent		
Employment	1.6 million	2 million
Employment % (25-64 years)	71.8% (2000)	79%
% Labour force with tertiary qualification	26.8%	45.7%
Culture of research, innovation and entrepreneurship		
Global Innovation Index	GII World Rank- 7 (2006-07)	GII World Rank- 8 (2012)
Entrepreneurship Monitor	TEA (total entrepreneurial activity) rating of 5.2% (2001)	TEA (total entrepreneurial activity) rating of 18.4% (in 2012), third highest in the world

2. Singapore

Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
A. Positioning on the global HE map		
Singapore Education launched in 2003	<ul style="list-style-type: none"> ▶ Singapore Education is a multi-government agency initiative led by the EDB, Singapore Tourism Board, SPRING Singapore, International Enterprise Singapore, and the MOE ▶ The objective was to develop Singapore as a global hub of educational excellence 	<ul style="list-style-type: none"> ▶ Since 2002, 10 foreign institutions have established branch campuses in Singapore under the EDB's Global Schoolhouse initiative ▶ At the end of 2011, 31 foreign universities were collaborating with local universities (the NUS, SMU, and the Nanyang Technological University) to offer joint programs, from bachelors to doctoral levels, in various disciplines ▶ Singapore is home to many distinguished foreign higher education institutions including INSEAD, DigiPen Institute of Technology, and the German Institute of Science and Technology (TUM Asia) ▶ Currently, more than 50,000 international students study in Singapore in private and public institutions
Global Schoolhouse		
B. Hub for talent		
Manpower 21-	<ul style="list-style-type: none"> ▶ Manpower 21 was launched in 1998 to make Singapore a knowledge-based economy after the Asian crisis in 1997 ▶ Focus of the plan: <ul style="list-style-type: none"> ▶ Maintaining competitiveness and flexibility ▶ Promoting entrepreneurship and domestic companies ▶ Growing manufacturing and services ▶ Developing human capital 	<ul style="list-style-type: none"> ▶ The plan covers workers' training and upgrading skills to meet the demands of rapid technological change and a constantly evolving and extremely competitive global economy. ▶ A record 79% of Singapore's residents, aged 25 to 64 years, are employed, up from 71.8% in 2003 ▶ Amid the improvement in educational and skills profile of the workforce, the share of professionals, managers and executives (PMEs) in the country's resident workforce rose from 27% in 2003 to 31% in 2013.

MOE- Ministry of education; EDB- Economic development board; ERC- Education review committee; SPRING Singapore is an agency under the Ministry of Trade and Industry

Source: Post secondary education, MOE- Singapore; Internationalization of Tertiary education services in Singapore- ADBI, October 2012

2. Singapore Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
C. Culture of research, innovation, and entrepreneurship		
SPRING partnership with ACE (Action community for entrepreneurship)	<ul style="list-style-type: none"> ▶ To promote entrepreneurship and first-time entrepreneurs ▶ SPRING SEEDS Capital ▶ ACE initiatives include mentorship programmes for ACE start-ups, and "BlueSky Exchange" networking sessions, ▶ Launched first ACE Overseas Chapter in Beijing 	<ul style="list-style-type: none"> ▶ CE supported 40 start-ups and 56 schools ▶ SPRING SEEDS Capital invested US\$7.4 million in 12 start-ups ▶ SPRING funded 34 commercialization projects through the Technology Enterprise Commercialisation Scheme (TECS) ▶ Two Biomedical Sciences Accelerators (BSA), Clearbridge BSA and Singapore MedTech Accelerator, were officially appointed in 2012 ▶ In total, 193 innovative start-ups were supported and incubated by SPRING and its partners in 2012
Singapore's Research, Innovation and Enterprise Council (RIEC) Singapore's National Research Foundation (NRF)	<ul style="list-style-type: none"> ▶ A public and private sector council chaired by the Prime Minister. ▶ Developed Singapore's Science and Technology Plan from 2006-2010, which involved funding of S\$13.6 billion ▶ NRF is where each research fellow will receive a grant up to S\$3 million over 5 years 	<ul style="list-style-type: none"> ▶ The Science and Technology 2010 plan helped Singapore distinguish itself as a front runner in innovation ▶ Between 2005-2010, the number of research scientists and engineers in the country increased from 21,000 to 26,000 ▶ Five new research centres of excellence were established. ▶ The 2010 ranking of the most cited institutions by Thomson Reuters and indexed engineering journals ranked NTU and NUS at the 8th and 9th places respectively

Source: Spring Singapore Annual Report 2012-2013; Internationalization of Tertiary education services in Singapore- ADBI, October 2012; Research, Innovation and Enterprise 2015 Singapore; Labour force in Singapore-2003 Ministry of Manpower Singapore

3. China

Overview and initiatives

Overview

Parameter	2000s	Recent
HE Overview		
Population	1.2 billion (2000)	1.35 billion
HE enrolment	23 million (2005)	31 million
HE GER	7.76%	27% (2013)
HEIs	~2,000 (2005)	~3,000, including 1,090 universities, 322 independent colleges, 1,215 non-university HEIs, and 384 other HEIs for adults
Positioning on the global HE map		
Globally ranked institutions (Times)	6 (2005)	7 (2013)
Hub for Talent		
Working age population (15-59 years)	NA	937 million
Employment	NA	767 million
Unemployment rate	4.1%	4.1%
Culture of research, innovation and entrepreneurship		
Global Innovation Index	GII World Rank- 29 (2006-07)	GII World Rank- 29 (2014)
Entrepreneurship Monitor	NA	TEA (total entrepreneurial activity) rating of 13%



3. China

Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
A. Positioning on the global HE map		
<p>Substantial government investment in Higher Education: RMB 101 billion (2006)</p> <p>Project 211: RMB 3.7 billion</p> <p>Project 985: Additional RMB 2.8 billion</p>	<ul style="list-style-type: none"> ▶ Project 211: Objective- to build ~100 HEIs of excellence in the 21st Century ▶ Project 985: Started in 1998, aimed at establishing ~40 world-class universities ▶ Formed C9 League, a group of China's elite research universities that benefit from the substantial funding 	<ul style="list-style-type: none"> ▶ In the past 20 years, China has: <ul style="list-style-type: none"> ▶ Established relationships with 154 countries and areas ▶ Sent 339,000 students abroad to study in more than 100 countries and areas ▶ Received 210,000 foreign students from 160 countries and areas ▶ Sent 1,800 teachers and experts to teach abroad and ▶ Employed 40,000 foreign teachers and experts
B. Hub for talent		
National Medium and Long-term Talent development Plan (2010-2020)	<ul style="list-style-type: none"> ▶ First comprehensive plan on human resources ▶ Target of 180 million 'highly skilled workers' by 2020, up from 114 million in 2010 	<ul style="list-style-type: none"> ▶ MOHRSS reported that 767 million of those aged 15 to 59 years were employed in 2012 ▶ In 2012, 371 million were employed in urban areas, an increase of 11.9 million over 2011, accounting for 48.4% of the overall working population ▶ The number of private enterprise employees in urban areas increased significantly from 45.8 million in 2008 to 69.1 million in 2012 ▶ Among the in 2012 graduates, 82.4% had full-time or part-time jobs and 2% were self-employed
C. Culture of Research, Innovation, and Entrepreneurship		
Government-mandated zones for industry-specific development	<ul style="list-style-type: none"> ▶ Beijing's Zhongguancun is China's Silicon Valley ▶ Building 150 start-up incubators for students returning from overseas 	<ul style="list-style-type: none"> ▶ According to the Global Entrepreneurship Monitor, nearly 25% of the adult population are entrepreneurs, twice that of the U.S. ▶ 75% of new jobs each year and 68% of exports come from entrepreneurial ventures ▶ The incubators have worked with ~8,000 enterprises and 20,000 students since 2011 ▶ 56% of entrepreneurs in China said that entrepreneurship education programmes at universities are improving

SOE- state owned enterprise; MOHRSS- The Ministry of Human Resources and Social Security

Source: People Daily, East Asia Forum, China Education Center, Times Higher Education

3. China

Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
China's Medium and Long-term National Plan for Science and Technology Development 2006-2020 (MLP)	<ul style="list-style-type: none"> ▶ China's goal of becoming an "innovation oriented nation" by 2020 	<ul style="list-style-type: none"> ▶ Over the last 30 years, China's research output has increased from ~2,000 to more than 150,000 journal articles and reviews per year. Relative to other countries, China increased its share of global research output from around 5% in 2002 to around 13% in 2011 ▶ China's papers in 54 Web of Science journal categories have surpassed 1,000 papers across the decade, with an average citation impact above the world average ▶ Overall in China, 100 institutions account for about 90% of research activity, as reflected in publications ▶ China's recent innovations include Tianhe-2 (the world's fastest supercomputer), a graphene aerogel developed by material scientists at Zhejiang University, and the Beidou Satellite Navigation System
<p>In 2012, China's total R&D expenditure exceeded RMB 1 trillion (USD 163 billion)</p> <p>China's National Patent Development Strategy (NPDS), 2011-2020</p>	<ul style="list-style-type: none"> ▶ China spends 1.84% of its GDP on R&D (OECD 2011) ▶ R&D expenditure has increased by 18% year-on-year since 2008 ▶ NPDS has set a target of 2 million annual patent applications by 2015 (up from around 1.2 million in 2010) 	<ul style="list-style-type: none"> ▶ National share of world publications (Thomson Reuters, 2011): 12.73% ▶ Researchers in R&D (per million population, World Bank): 863 in 2009 ▶ Between 2009 and 2011, patent filings worldwide increased by 293,900, with the Chinese patent office SIPO accounting for 72% of this growth. ▶ Patents grants to residents at domestic patent office (WIPO, 2011): 112, 347 ▶ In 2012, the total patent applications filed (invention, utility and industrial) were 2.05 million, reaching the target set for 2015 much ahead of time

Source: China's absorptive state- Research, innovation and prospects of for China-UK collaboration 2013, Wharton Knowledge

4. U.S. Overview and initiatives

Overview

Parameter	2000s	Recent
HE Overview		
Population	284.5 million (2000)	320 million
HE enrolment	13.2 million (2000)	21 million
HE GER	67.8%	94.2% (2012)
HEIs	4,182 (2000)	4,495 (2010)
Education expenditure as a % of GDP	4.85%	5.42%
Positioning on the global HE map		
Globally ranked institutions (Times)	54	51
International students (based on F1 visa status)	110,000	524,000
Hub for talent		
Employment rate	63.9%	59%
Unemployment rate	5.8%	6.3%
Culture of research, innovation and entrepreneurship		
Global Innovation Index	GII World Rank- 1 (2006-07)	GII World Rank- 5 (2013)
Entrepreneurship Monitor	TEA (total entrepreneurial activity) rating of 11.7%	TEA (total entrepreneurial activity) rating of 13%



4. U.S. Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
A. Positioning on the global HE map		
The F-1 visa program; OPT program	<ul style="list-style-type: none"> ▶ Allows foreigners, largely from emerging economies, to gain access to a American higher education 	<ul style="list-style-type: none"> ▶ The number of foreign students grew dramatically from 110,000 in 2001 to 524,000 in 2012. China accounts for the largest share ▶ Between 2008-12, 85% of foreign students pursuing a bachelor's degree or above attended colleges and universities in 118 metro areas. They contributed approximately \$21.8 billion in tuition and \$12.8 billion in other spending ▶ The number of international scholars working at US colleges and universities—as researchers, instructors and professors—rose to 115,000 last year from 86,000 in 2001
Relatively decentralized system	<ul style="list-style-type: none"> ▶ Most higher education institutions are autonomous and self-governing in the US ▶ Quality assurance in the American HE system is through accreditation, recognition of accrediting organizations, federal oversight of higher education, state quality review of higher education and government approvals through established standards and policies 	<ul style="list-style-type: none"> ▶ NA

OPT- Optional Practical Training; STEP- Student Temporary employment program; SCEP- Student career experience program; DOL- Dept of Labour; ETA- Education and Training Administration

Source: Brookings; New York Times; Quality Assurance System in Higher Education- USA by NIAD-UE 2010; Office of Personnel management, Bureau of Labor Statistics, U.S. Department of Labor, Employment and Unemployment Among Youth Summary- August 2014

4. U.S. Overview and initiatives

Initiatives

Initiative	Objective / Description	Initiative
B. Hub for talent		
<p>Pathways Programs for youth employment with the federal government</p> <p>DOL's ETA has programs to ensure that youth have the skills and training they need to transition to successful careers</p>	<p>Pathways Program</p> <ol style="list-style-type: none"> 1. Internship program (replacing STEP and SCEP)* 2. Presidential Management Fellows (PMF) Program <p>DOL's ETA Programs include:</p> <ol style="list-style-type: none"> 1. Jobs Corps 2. Youth discretionary grants 3. Youth formula-funded grant programs 4. Apprenticeship options 5. Summer Jobs+ 	<ul style="list-style-type: none"> ▶ For the PMF Class of 2013, there were 663 finalists from over 12,000 nominees ▶ In July 2014, the youth labour force grew by 14.5% y-o-y to a total of 23.4 million ▶ In the U.S. today, ~37,000 program sponsors, representing over a quarter million employers offer registered apprenticeship training to ~440,000 apprentices ▶ In July 2014, 51.9% of young people were employed, up from 50.7% a year earlier. There were 20.1 million employed 16-24 year-olds. The number of unemployed youth was 3.4 million, down from 3.8 million a year earlier
C. Culture of research, innovation, and entrepreneurship		
<p>Academic institutions accounting for second-highest source of funding for research after the US Federal Government</p>	<ul style="list-style-type: none"> ▶ Universities conduct more than 55% of basic research in the U.S. ▶ University research provides a training ground for and educate the next generation of scientists, engineers, doctors, teachers and entrepreneurs 	<ul style="list-style-type: none"> ▶ Stanford University's graduate students Larry Page and Sergey Brin, whose basic research was supported by a National Science Foundation grant, generated the idea which is at the root of Google ▶ Supported by the U.S. Department of Agriculture (USDA), SAS* began as a research project at the North Carolina State University to analyze agricultural data. It is today the world's largest privately held software company and the leader in business analytics software and services. SAS employs more than 11,000 people. ▶ A123 Systems, founded by Massachusetts Institute of Technology (MIT) researchers in 2001, is today at the centre of efforts to develop an advanced battery manufacturing industry in the U.S., supported by the Department of Energy. ▶ ONY, Inc. of Buffalo, New York, created a lung surfactant. The company founders conducting research at the University at Buffalo with support from the National Institutes of Health

5. UK

Overview and initiatives

Overview

Parameter	2000s	Recent
HE Overview		
Population	58.9 million (2000)	63.1 million
HE enrolment	2 million (2000)	2.5 million
HE GER	58% (2000)	61.8%
HEIs	NA	160-recognized; 700- other colleges
HE expenditure as a % of GDP	0.78%	1.02% (2010)
Positioning on the global HE map		
Globally ranked institutions (Times)	24	29
International students	370,000 (2007-08)	425,265 (2012-13)
Hub for Talent		
Employment rate	NA	73%
Unemployment rate	5.4%	6%
Culture of research, innovation and entrepreneurship		
Global Innovation Index	GII World Rank- 3 (2006-07)	GII World Rank- 3 (2013)
Entrepreneurship Monitor	TEA (total entrepreneurial activity) rating of 7.7%	TEA (total entrepreneurial activity) rating of 7.3%



5. UK

Overview and initiatives

Initiatives

Initiative	Objective / Description	Impact
A. Positioning on the global HE map		
Higher education institutions contribute around £59 bn to the UK economy annually and are a major export earner for the country	<ul style="list-style-type: none"> ▶ In 2010, UK universities accounted for £5.3 billion or around 3% of all services exports 	<ul style="list-style-type: none"> ▶ Through their international activities, the number of students coming to the UK is growing fast ▶ International students in the U.K. totalled 425,265 in 2012-13. The top two countries of origin for these students are China and India. In 2008-09, more than 47,000 came from China while 34,000 came from India ▶ Approximately 22,000 UK students are currently studying in other countries
B. Hub for talent		
Higher Education Funding Council for England's (HEFCE) Widening Participation Allocation	<ul style="list-style-type: none"> ▶ HEFCE supports with internships and mentoring programmes ▶ It has increased its investment to support progression from higher education into employment or postgraduate study 	<ul style="list-style-type: none"> ▶ HEFCE's funding was £41 million in 2012-13, up from £19 million in 2011-12 ▶ Around 69% of young people not pursuing full-time education courses were employed at the end of 2013 ▶ The youth unemployment rate in the UK (20%) was lower than the European Union average in 2013 (23.5%).
C. Culture of research, innovation, and entrepreneurship		
U.K. is a founding GEM nation with a team based at Aston University	<ul style="list-style-type: none"> ▶ The GEM UK project conducts an annual survey of around 30,000 individuals and has been widely used by a range of organizations in the private and public sector (national, regional and local) to obtain comparative measures of entrepreneurial attitudes, activity and aspiration for the UK. 	<ul style="list-style-type: none"> ▶ One-fifth of working age individuals in the UK were engaged in entrepreneurial activity or intended to start a business within the next three years ▶ Total Entrepreneurial Activity (TEA) rate in the UK of 7.3% in 2013 compares favourably to France at 4.6% and Germany at 5.0% but lags that of the US at 12.7%. ▶ Entrepreneurial activity in the UK is highest amongst the middle age groups, with 35-44 year olds displaying the highest rate of early-stage entrepreneurial activity ▶ In 2012-13, 5.8% of the working age adult population were opportunity-motivated early-stage entrepreneurs, up from 5.1% in 2010

Source: International student statistics: UK higher education-UKCISA; HEFCE-OFFA Outcomes of access agreement, widening participation strategic statement and National Scholarship Programme monitoring for 2012-13; National strategy for access and student success in higher education- Dept of BIS April 2014; Patterns and Trends- UK Higher Education 2012; theguardian; Office of National Statistics- March 2014

5. UK

Overview and initiatives

Initiatives

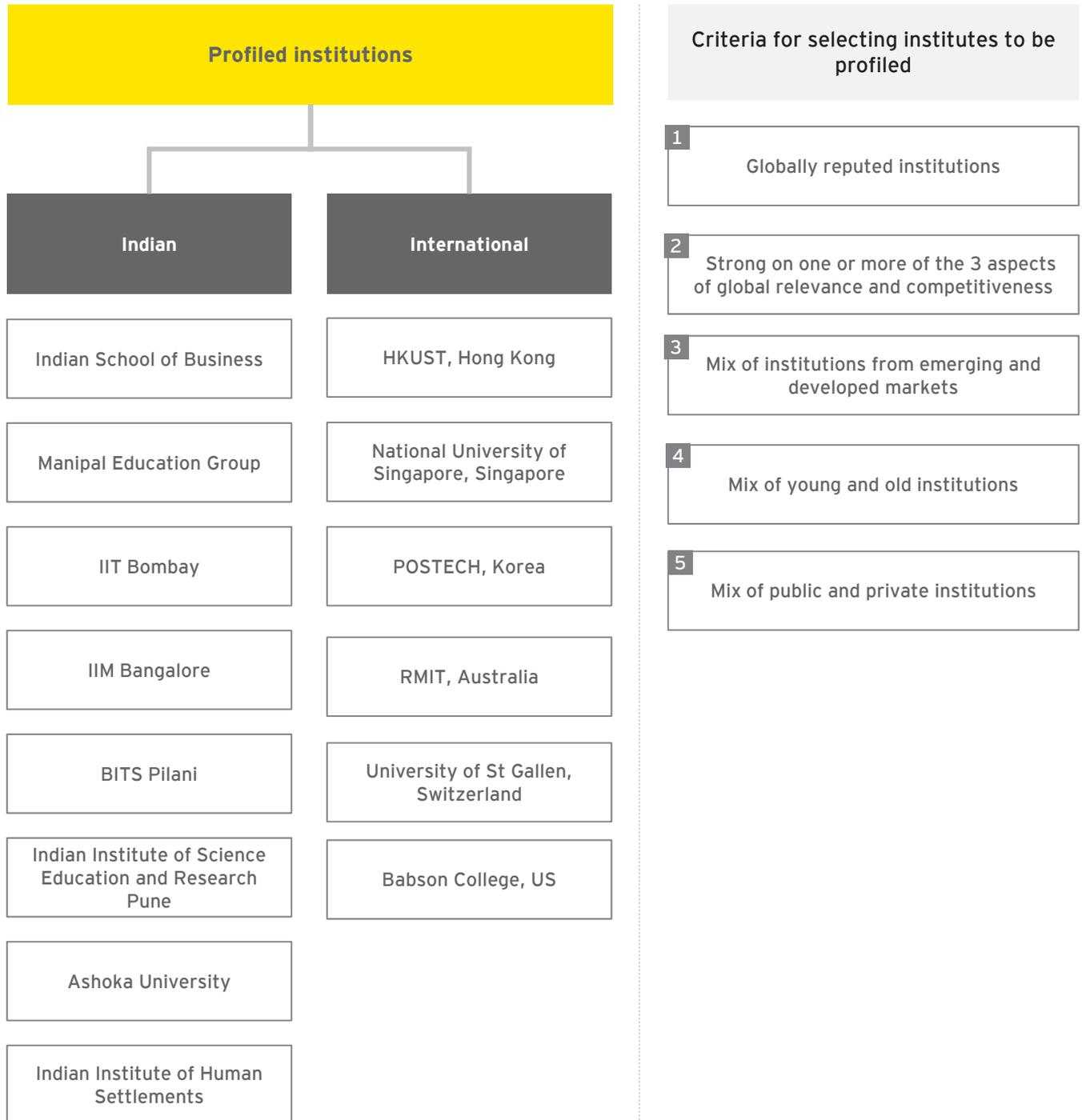
Initiative	Objective / Description	Impact
<p>HEFCE</p> <p>Research partnerships with other countries. E.g. UK-India Education and Research Initiative (UKIERI)</p> <p>Council for Industry and HE-UK Innovation research center (CIHE-UK-IRC)</p>	<ul style="list-style-type: none"> ▶ HEFCE is a public sector body that funds and regulates universities and colleges in UK and invests on behalf of students and the public to promote opportunity, choice and excellence in research, teaching, and knowledge exchange ▶ In March 2014, HEFCE announced a total of £1.6 billion of research funding ▶ UKIERI was set-up in 2006 with the aim of enhancing educational links between India and the UK. More than £25 million has been allocated including for Higher Education & Research ▶ CIHE-UK-IRC Task Force maps the UK's R&D Landscape 	<ul style="list-style-type: none"> ▶ The UK accounts for 15.9% of the world's most highly cited research articles ▶ Examples of funding: £33 million partnership between University College London and the Royal Free London NHS Foundation Trust in the Institute of Immunity and Transplantation; £43 million partnership between the University of Sheffield's Advanced Manufacturing Research Centre (AMRC) and manufacturing companies to develop the AMRC Factory 2050 and the HEFCE Catalyst Fund's awarding £3 million to Newcastle University for the Neptune National Centre for Subsea and Offshore Engineering. ▶ UKIERI's projects include Low-cost organic-Inorganic Hybrid electroluminescent Devices by University of Cambridge-IIT Delhi; Low Temperature solid oxide electrolyser for conversion of CO2 to organic compounds by Newcastle University-IIT Delhi; Novel Approaches to Tackling Tuberculosis by University of Birmingham-IISc Bangalore; Use of Nanomaterials in Smart Energy Systems by University of Surrey-IIT-K; Contamination Monitoring using Mobile Sensor Networks (CM-MSN) by University of Exeter-IISc Bangalore and many more. ▶ CIHE-UK-IRC reported that out of the total UK R&D expenditure of £26.4 billion in 2010, the government funded £8.5 billion (32%) and the HE sector spent £7.1 billion (27%)

Source: GEM Consortium, UK Report 2013; UKIERI; HEFCE Annual Report 2013; CIHE-UK-IRC Impact report; CBR

Key learnings from globally competitive and relevant higher education systems

Aspect	Key learnings
<p>Positioning on global higher education map</p>	<ul style="list-style-type: none"> ▶ Setting up of government sponsored education promotion arms to attract foreign students to the country's HE system ▶ Incentives provided to foreign institutes to set up campuses (e.g. those in education-focused zones such as Incheon, South Korea, and Global Schoolhouse, Singapore) including tax breaks, repatriation of profits, easy visa norms, single window clearances etc. ▶ Easing of visa norms to attract high-quality faculty and students
<p>Hub for talent</p>	<ul style="list-style-type: none"> ▶ Industry partnerships for domestic jobs: Platforms such as industry job fairs and internet portals which bring industry and job seekers together ▶ Internship/Apprenticeship programmes in collaboration with private and public companies to offer students hands-on experience ▶ Training, skilling and up-skilling programmes run by the Government
<p>Research, innovation and entrepreneurship</p>	<ul style="list-style-type: none"> ▶ Strong government funding for R&D: Special funding from the government (Brain Korea) has placed some HEIs among the top-ranked institutions for R&D (e.g. POSTECH) ▶ Partnerships with other countries on innovation: UKEIRI is an example of how innovation can be achieved by collaboration between HEIs of two countries ▶ Incentives to attract international scholars of repute and Nobel laureates for collaboration on research ▶ Entrepreneurship initiatives (incubation): China has specific zones for incubation centers supported by the Government (e.g. National Entrepreneurship Research Center at Tsinghua University) ▶ Government-sponsored mentorship programme and seed capital to guide start-ups and entrepreneurs

We have profiled some high-quality Indian and international higher education institutions to understand what has enabled them to achieve global repute and relevance



Indian School of Business (ISB)

Overview

- ▶ Established in 2001, ISB is a not-for-profit, independent management institution
- ▶ It offers postgraduate, fellowship, post-doctoral and executive education programs in management
- ▶ ISB has 2 campuses
- ▶ 1400+ PGP students
- ▶ 200+ faculty

Metrics	Outcomes	Enablers
Global recognition, student and faculty mobility	<ul style="list-style-type: none"> ▶ Ranking: Ranked 36th in the Global MBA rankings by <i>Financial Times</i> (FT), London, in 2014 ▶ International faculty: 20% of total faculty is international ▶ International board: 59% of board is international ▶ Awarded AACSB accreditation in 2011 	<ul style="list-style-type: none"> ▶ Visiting faculty from global B-schools: More than 105 visiting faculty and researchers from the best B-schools in the US, Europe, Australia, and various Asian countries ▶ Recruits faculty with international experience from institutes such as the University of Rochester, Kellogg, etc. ▶ Academic collaborations: With the Kellogg School at Northwestern University, Wharton School, London Business School(LBS) and Tufts University for co-certification, curriculum development, faculty and student exchange and joint research
Research and innovation	<ul style="list-style-type: none"> ▶ Research articles: ISB faculty have published more than 150 articles, 60 papers and 60 books till date ▶ Leads in author count of Indian faculty in the FT list of the top 40 management journals between 1990-2009. 	<ul style="list-style-type: none"> ▶ Research Centres of Excellence: 8 centers of excellence to focus on research and development in collaboration with organizations like Bharti Group, the Hero Group ▶ International collaborations for joint research
Entrepreneurship	<ul style="list-style-type: none"> ▶ Wadhvani Centre for Entrepreneurship Development (WCED) was established in 2001. ▶ Till 2012, 17 startups incubated at the incubation center which was setup in 2001. Major ventures from ISB'S incubator are Orkash and Richcore Lifesciences. 	<ul style="list-style-type: none"> ▶ Entrepreneurship focused programmes: It recently launched Technology Entrepreneurship programme ▶ Incubation centre: ISB launched Entrepreneurs Development Initiative (EDI) and Planning an Entrepreneurial Venture (PaEV) to incubate and promote students' entrepreneurial ventures
Employability	<ul style="list-style-type: none"> ▶ Employability rankings: Rank improved from 148 in 2012 to 52 in 2013 in RH Emerging global employability rankings ▶ 884 offers made to 766 students by 350 companies in 2014 ▶ 8% of students placed in international locations (2013) 	<ul style="list-style-type: none"> ▶ Students come with prior work experience (average: 5 years) ▶ ISB has an Experiential Learning Program (ELP) helping students work on real-life problems ▶ Practical work ex: ISB partnered with SREI infrastructure giving students experience to real time infrastructure projects

Source: Institution website, Financial Times, RH Emerging

Manipal Education Group

Overview

- ▶ Established in 1953, Manipal University was the first private institution to secure Deemed University status
- ▶ It offers ~ 300 undergraduate, post-graduate and doctoral courses in 15 streams
- ▶ Headquartered in Bangalore, India, Manipal Global also owns and operates university campuses in Malaysia, Antigua, Dubai and Nepal
- ▶ Student strength of ~ 27,000 (excluding those enrolled in distance education programme) across three universities and nine campuses
- ▶ It currently services and supports more than 300,000 students, many of them through its award-winning technology platform, EduNxt™

Metrics

Global recognition, student and faculty mobility

Outcomes

- ▶ **Ranking:** First Indian private university to be ranked in QS World University Rankings. Ranked 85th in 2014 in QS World University Rankings for BRICS
- ▶ **Global campuses:** 6 campuses across Malaysia, Antigua, Dubai and Nepal
- ▶ **International students:** 1400 students from 20 countries; mainly from China, Vietnam, Indonesia, Malaysia and India
- ▶ **Twinning programs:** With more than 74 institutes across 6 countries
- ▶ **International collaborations:** More than 22 international collaborations
- ▶ **Student and faculty exchange:** MoUs with Chinese universities for student and faculty exchange

Enablers

- ▶ Strong reputation for medical education in India, superior infrastructure, transparent governance has helped Manipal in setting up global campuses

Entrepreneurship

- ▶ **Manipal University Technology Business Incubator (MUTBI)** setup in 2010
- ▶ 14 current startups in incubation

- ▶ Incubator funded by NSTEDB (National Science & Technology Entrepreneurship Development Board) and DST (Department of Science & Technology). 1 satellite center in Jaipur and 2 in Mangalore
- ▶ More than 30 mentors for incubation

Employability

- ▶ **Placement:** 1,224 offers for 984 students of Manipal Institute of Technology in 2013-14. 35 recruiting companies participated in placements in 2013-14
- ▶ **International placements:** 16 international placements in Manipal School of Management in 2012-13

- ▶ **Industry partnerships:** Collaborated with Intel, Infosys and others for internships and placements
- ▶ **Job assistance:** Provided to students through iRize placement initiative in collaboration with KPMG and Voltas
- ▶ Uses EduNxt platform to offer programs related to industry requirements
- ▶ Conducts regular faculty training sessions to serve industry's needs

Source: Institution website, management interviews

IIT Bombay

Overview

- ▶ The second IIT established in 1958, IIT Bombay was the first to be set up with foreign assistance.
- ▶ In 1961, the Indian Parliament decreed that the IITs are "Institutes of National Importance"
- ▶ The institute is recognized worldwide as a leader in the field of engineering education and research
- ▶ IIT Bombay is academically organised into 14 academic departments, ten Centres, two Schools and three interdisciplinary programmes
- ▶ On an average, it admits 650 students for its undergraduate programmes and 1,050 students for Ph.D/Postgraduate programmes every year

Metrics	Outcomes	Enablers
Global recognition, student and faculty mobility	<ul style="list-style-type: none"> ▶ Ranking: Ranked between 251-275 in Times Higher Education ranking in 2014. Ranked 222 in QS University rankings ▶ International students: 58 (2013) ▶ Student exchange: More than 110 international exchange students since 2003 	<ul style="list-style-type: none"> ▶ Faculty and student exchange: Has MoUs with several universities in Asia, Australia, Europe and USA. These MoUs facilitate collaboration through faculty and student exchange programmes
Research and innovation	<ul style="list-style-type: none"> ▶ Research articles: ISB faculty have published more than 150 articles, 60 papers and 60 books till date ▶ Leads in author count of Indian faculty in the FT list of the top 40 management journals between 1990-2009 	<ul style="list-style-type: none"> ▶ Large number of laboratories and research centers for different fields ▶ Government and industry collaborations: Collaborations with Indian Space Research Organization in space research and with TCS by setting up a research cell ▶ Funding: Research: ~ INR2.9 billion by 2013 ;industry ~ INR0.27 billion in 2013 ▶ Consultancy projects: Undertakes consultancy projects for the industry
Entrepreneurship	<ul style="list-style-type: none"> ▶ Incubator: An IT business incubator was set up at Kanwal Rekhi School of Information and Technology, IIT Bombay in 1999. SINE, the current incubator came into existence in 2004. More than 24 companies have been incubated since its inception ▶ 17 companies are currently being incubated under SINE 	<ul style="list-style-type: none"> ▶ Partnerships with entrepreneurship networks: Partnerships with National Entrepreneurship Network and Department of IT and Department of Science & Technology ▶ Seed grant: In the form of loans from The Ministry of Communication and Information Technology of the Government of India.
Employability	<ul style="list-style-type: none"> ▶ Placement: 72.56% B.Tech students and 80% students placed in dual degree program ▶ Internships: 119 internships in international universities 	<ul style="list-style-type: none"> ▶ Industry linkages for internship: Internships with players such as TCS, Texas Instruments and Cummins prepare students well for the industry ▶ Several faculty members with functional expertise and industry experience

Source: Institution website

IIM Bangalore (IIM-B)

Overview

- ▶ An autonomous institute established in 1973, IIM-B offers a range of doctoral, post-graduate and executive education programmes
- ▶ There are 750 graduate students studying at the institute
- ▶ For the sixth consecutive year in 2013, IIM-B was ranked the best business school in Central Asia by Eduniversal, Paris.
- ▶ IIM-B received the prestigious Obama-Singh 21st Century Knowledge Initiative award in 2013.

Metrics	Outcomes	Enablers
Global recognition, student and faculty mobility	<ul style="list-style-type: none"> ▶ Ranking: Ranked 4th in the Asia Pacific region of the QS Global 200 Business Schools Report 2013. Rated by Eduniversal as the No.1 B-school in Central Asia for six consecutive years ▶ International faculty: 6% of total faculty is international 	<ul style="list-style-type: none"> ▶ Faculty from international institutes: Faculty including PhDs from London School of Economics, University of Pennsylvania and Michigan State University; between 2008 and 2010, recruited 23 PhDs as faculty from institutes including MIT and Wharton ▶ Agreement with Harvard Business Publishing to distribute faculty teaching cases to help to improve its curriculum development
Research and innovation	<ul style="list-style-type: none"> ▶ Books and research articles: In 2013, IIMB researchers published 6 books and 73 articles in academic journals ▶ 72 research and case writing projects conducted in 2013 	<ul style="list-style-type: none"> ▶ Research partnerships: With universities including University of British Columbia, University of Exeter, Singapore Management University, Richard IVEY School of Business ▶ CoEs: 6 centers of excellence for research in IT, ERP, governance, supply chain, entrepreneurship and public policy ▶ Financial rewards: Cash incentives of INR100,000 and US\$10,000 for each case study and papers; US\$250,000 grant from United States-India Educational Foundation (USIEF)
Entrepreneurship	<ul style="list-style-type: none"> ▶ Incubation centre set up in March 2002 for entrepreneurial studies and incubation support (Nadathur S Raghavan Centre for Entrepreneurial Learning) ▶ 32 companies incubated so far; currently 7 being incubated 	<ul style="list-style-type: none"> ▶ Partnerships with NASSCOM and The Indus Entrepreneurs to facilitate the entrepreneurship ventures of students ▶ Mentorship programme: More than 10 mentors with wide industry experience
Employability	<ul style="list-style-type: none"> ▶ Placement: 100% placements for all batches with most students getting a pre placement offer and average package of INR17 lakhs in 2014 ▶ International placements: On average, 8-10% of students are placed in international locations 	<ul style="list-style-type: none"> ▶ Faculty with industry experience: Faculty strength of more than 100 with diversified industry experience ▶ Alumni network: Leverages alumni networks for placements

Source: Institution website

BITS Pilani

Overview

- ▶ Started in early 1900s, the university was named the Birla Institute of Technology and Science (BITS), Pilani, in 1964
- ▶ In 2000, BITS opened a branch in Dubai. This made it the first Indian university with an overseas campus
- ▶ BITS Goa was opened in 2004 and BITS Hyderabad in 2008
- ▶ The Institute offers 18 undergraduate degree programmes and 21 undergraduate and postgraduate programmes

Metrics	Outcomes	Enablers
Global recognition, student and faculty mobility	<ul style="list-style-type: none"> ▶ Ranking: Ranked in the range 201-250 in QS University Asia rankings in 2014 ▶ Accreditation: BITS, Pilani has been accredited by the National Assessment & Accreditation Council (NAAC) with an "A" grade in 2009 	<ul style="list-style-type: none"> ▶ Ranking data: Established Institutional Knowledge and Analysis (IKA) Cell to put in place timely, accurate and efficient data storage and access process in order to collect institutional data on various metrics ▶ Facilitates initiatives such as benchmarking, rankings, accreditation
Research and innovation	<ul style="list-style-type: none"> ▶ In 2012, 560 faculty members presented papers at various national and international conferences. ▶ Research projects: 349 sponsored research projects in 2014 	<ul style="list-style-type: none"> ▶ CoE: It has 6 centers of excellence to focus on research and development ▶ International collaborations: Tie up with the University of Southern California for R&D. It is looking to tie-up with University of California, Berkeley, and the University of San Diego ▶ International exposure to researchers: Sponsors faculty members to enable them to travel to research universities ▶ PhDs: A total number of 587 students have been awarded Ph.D. degrees by the Institute since its inception
Entrepreneurship	<ul style="list-style-type: none"> ▶ Set up in 2002, the BITS Technology Business Incubator (TBI) has incubated about 15 companies so far ▶ Received investments from popular funds such as Sequoia Capital and the Indian Angel Network for start-ups 	<ul style="list-style-type: none"> ▶ Incubator: The Centre for Entrepreneurial Leadership which works closely with the TBI at BITS Pilani helps start-ups interact with VCs and angels to help them secure investments
Employability	<ul style="list-style-type: none"> ▶ Placement: During last three years (2011-13) for engineering programmes, placement was around 95-100% and for other degree programmes, it ranges from 50 to 80%. Average salary offered during last three years are INR5.2 lakhs, INR6.9 lakhs and INR7.5 lakhs. More than 200 organizations participate in campus interviews each year 	<ul style="list-style-type: none"> ▶ Industry linkages: BITS receives feedback from industry through its University-Industry Linkage programmes and accordingly updates the course curriculum ▶ Practice School Programme: Under this programme students are placed for five-and-half months during their final year in India and abroad to work on live projects

Source: Institution website

Indian Institute of Science Education and Research (IISER), Pune

Overview

- ▶ IISER Pune is an autonomous institution, established in 2006 under MHRD, Government of India, and is focused on providing scientific and research based education
- ▶ Offers courses such as Integrated B.S - M.S Programme , M.S Programme, Integrated Ph.D Programme, Ph.D Programme & Post-Doctoral Programmes
- ▶ The annual fee per student ranges from INR20,000 to INR30,000
- ▶ It offers more than 200 academic courses encompassing four basic disciplines of physics, chemistry, biology, mathematics and the humanities, addressing the latest developments in industry

Metrics

Research and innovation

Outcomes

- ▶ IISER faculty awarded with international awards such as the DuPont young professor award
- ▶ Research papers: Number of research papers published increased from 6 in 2006 to 199 in 2013. More than 600 research papers published till 2013
- ▶ Research student intake has increased from 44 in 2006 to 335 in 2014
- ▶ Out of 135 graduate students since inception, 55 are pursuing PHDs, 22 are working on research projects and 22 are working in R&D

Enablers

- ▶ Research partnerships: 16 research partnerships with institutes and organizations including the Science and Technology Services of the French Embassy, the Max Planck Institute of Gravitational Physics, Germany, and the New Mexico States University, US
- ▶ Research centres: Several research-centres have been set up in the different IISER campuses such as Max Planck Partner Group in Glyco-nanotechnology, Max Planck Partner Group in Quantum Field Theory, DBT Centre of Excellence (CoE) in Epigenetics and DST Unit on Nanoscience
- ▶ Curriculum design: Incorporates research methodologies in interdisciplinary subjects with strong background in the sciences. Curriculum is on lines of the courses at Harvard and Oxford Universities
- ▶ Visiting faculty: Distinguished scientists visit the Institute, interact with faculty and students and lecture on frontier and emerging research areas
- ▶ Faculty with international experience

Emerging institutes operating in niche subject areas

Ashoka University: A Liberal arts-focused private university

- ▶ The university was inaugurated in 2012 and its first batch of students joined in August 2014. It has proposed a student capacity of 4,000
- ▶ Offers Bachelor of Arts Honors degrees in Economics, English, History, Mathematics, Philosophy, Political Science, Psychology and Sociology
- ▶ The four-year degree course will cost over INR20 lakh

Traction so far	Enablers
<ul style="list-style-type: none"> ▶ Students: The undergraduate class will comprise of 350 students while the postgraduate program has a class size of 200. The university has received a sizable number of applications for its undergraduate program 	<ul style="list-style-type: none"> ▶ Faculty: It has attracted top faculty from global institutes. Some of them include: Jonathan Gil Harris, English professor, George Washington University; AK Shivakumar, member of National Advisory Council of India, and visiting faculty of Economics at Harvard University ▶ It has roped in prominent academicians including Kaushik Basu and Ramchandra Guha for its academic council ▶ Private and industry funding: It has an illustrious founding team of 10-11 members including the likes of Sanjeev Bikhchandani, the founder of Naukri.com, Ashish Dhawan, the founder of the Central Square Foundation and former senior MD, ChrysCapital, Puneet Dalmia MD of Dalmia Cements and Anil Rai Gupta, Joint MD Havells India ▶ Collaborations: It has partnered with the University of Pennsylvania, University of Michigan and Carleton College and Sciences and is in talks with other global institutions

Indian Institute of Human Settlement (IIHS): A theme-based public research institution

- ▶ Established in 2012, IIHS focuses on urbanization and transformation of human settlements
- ▶ Offers programs at the postgraduate and executive levels
- ▶ It is owned and promoted by a group of eminent Indians

Traction so far	Enablers
<ul style="list-style-type: none"> ▶ The institute has ~1,100 students and ~100 faculty members in just a span of two years ▶ Partnership with three institutions from abroad namely MIT, University of Cape Town and University College London for faculty and student exchange ▶ Research: The faculty have published 27 research papers and are currently working on 6 research projects 	<ul style="list-style-type: none"> ▶ Curriculum: IIHS curriculum has been collaboratively developed by international faculty ▶ Specialized faculty: Faculty specializing in research has enabled IIHS to promote a culture of research ▶ Internationally renowned advisors: IIHS is advised by eminent educationists (domestic and international), key government officials and industry personnel ▶ Funding: IIHS is well supported by both public and private funding ▶ Involvement in international research networks such as The Urban Knowledge Network Asia and various UN entities

Hong Kong University of Science and Technology (HKUST), Hong Kong

Overview

- ▶ HKUST is a public university established in 1991
- ▶ It has 5 Schools: School of Business & Management, Sciences, Engineering (together accounting for 90% of enrolment), Humanities & Social Sciences, and the HKUST Fok Ying Tung Graduate School
- ▶ 12,596 enrolment (UG:PG - 69:31); 3,625 international students representing a large number of nationalities
- ▶ 627 teachers

Metrics	Outcomes	Enablers
Global recognition, student and faculty mobility	<ul style="list-style-type: none"> ▶ Rankings: Times HE World University Ranking of 51 in 2014 ▶ International faculty: 95% of teachers have international background ▶ International students: 3,625 international students, representing numerous nationalities ▶ Exchange programs with several international universities 	<ul style="list-style-type: none"> ▶ Top leadership: Appointed well-known serving head of a top university from the West as its President ▶ Autonomy: Has freedom to innovate in academic research and instructional delivery
Research and innovation	<ul style="list-style-type: none"> ▶ Research publications: More than 47,000 research publications by faculty till date ▶ Research projects: Number of research projects increased from 551 in FY05 to 742 in FY13 	<ul style="list-style-type: none"> ▶ 11 research institutes and 48 research centers ▶ Received HK\$1.2 billionn in research funding between 2008 and 2011; research income accounts for 52% of total income ▶ Commercializing research: Research and development corporation to commercialize research
Entrepreneurship	<ul style="list-style-type: none"> ▶ Entrepreneurship centre opened in 2000 to encourage participation of university academic staff members and students in the commercialization of new technology ▶ 7 start-ups in incubation and 28 spin outs since inception 	<ul style="list-style-type: none"> ▶ Partnerships with internal departments and external stakeholders to promote startups ▶ Entrepreneurship programme: Recently started an initiative called "E-Academy" to systematically guide and train students to be entrepreneurs
Employability	<ul style="list-style-type: none"> ▶ Employability rankings: Ranked 18th in global employability rankings in 2013 ▶ Placements: 80% of 2013 graduates were employed and 15% pursued higher education. In 2013, 73% MBAs were fully employed, with 9% going for higher studies and 10% not seeking employment 	<ul style="list-style-type: none"> ▶ Focuses on science and technology and business management in sync with the requirements of the economy

Source: Institution website, RH Emerging rankings

National University of Singapore (NUS), Singapore

Overview

- ▶ Founded in 1980 after merger of University of Singapore (formed in 1963) with Nanyang University; Public university; corporatized in 2006
- ▶ 16 faculties and schools, including engineering, business administration, architecture, law, medicine, music, nursing, pharmacy etc.
- ▶ 7 overseas colleges at major entrepreneurial hubs in Shanghai and Beijing (China), Israel, India, Stockholm (Sweden), Silicon Valley and Bio Valley (US)
- ▶ Faculty strength of 2,374

Metrics	Outcomes	Enablers
Global recognition, student and faculty mobility	<ul style="list-style-type: none"> ▶ Ranking: Times HE World University Ranking of 25 in 2014 ▶ Student exchange: 1,966 students involved in student exchange programs; ▶ International students: 11,113 students representing a large number of nationalities ▶ International partnerships with universities including Yale, Harvard, and Johns Hopkins 	<ul style="list-style-type: none"> ▶ Student exchange programs with 300 universities in 40 countries
Research and innovation	<ul style="list-style-type: none"> ▶ Research papers: More than 8,000 research publications in international journals in 2013; over 2,200 ongoing research projects ▶ Patents: 519 patents filed and 51 patents granted. 341 invention disclosures 	<ul style="list-style-type: none"> ▶ External research grants of S\$589 mn ▶ Three research centres of excellence (RCE) and 24 research institutes/ centres ▶ Tie-up with Association of Pacific Rim Universities (APRU) and International Alliance of Research Universities (IARU)
Entrepreneurship	<ul style="list-style-type: none"> ▶ More than 100 companies received pre-incubation and incubation support in 2013 ▶ Three start-ups from NUS received ~S\$14 million in FY14 	<ul style="list-style-type: none"> ▶ Established NUS Enterprise in 2001 to promote entrepreneurship ▶ Partnership with iLead to provide entrepreneurship experience to students ▶ Start-Up Validation Programme to guide start-ups through the ideation and validation process
Employability	<ul style="list-style-type: none"> ▶ Employability rankings: Ranked 49th in RH Emerging global employability rankings (2013) ▶ Placement: 98% of NUS Business school graduates placed within three months of graduation 	<ul style="list-style-type: none"> ▶ Industry partnerships: Innovation Generation (iGen) Programme and Industry Partnership Programme (IPP) were launched in February 2014 to promote industry learning. NUS Career Centre works with industry partners to co-create industry-related content and industry-specific learning opportunities for jobs

Source: Institution website, RH Emerging rankings

Pohang University of Science and Technology (POSTECH), Korea

Overview

- ▶ Founded in 1986
- ▶ Private; set-up by Pohang Iron and Steel Company (POSCO)
- ▶ 11 undergraduate departments including 7 Engineering and 4 Science
- ▶ 21 postgraduate departments in engineering and science consisting of graduate/specialized graduate schools
- ▶ 3000+ students (45-55 UG: PG ratio)
- ▶ 260+ faculty members

Metrics

Global recognition, student and faculty mobility

Outcomes

- ▶ Ranking: Ranked 66 in Times Higher Education world university rankings
- ▶ International faculty: 6.7% of total faculty is international
- ▶ Summer schools: Since 2004, POSTECH has sent abroad an average of 90 students per year through the summer session program, which allows students to take summer school courses at top-class foreign universities

Enablers

- ▶ International agreements: More than 92 sister universities in 24 countries, exchanging scholars, students, and researchers

Research and innovation

- ▶ 6 research papers per faculty member in 2012
- ▶ Number of citations per paper: 12
- ▶ Total academic papers in 2012: 2,041
- ▶ Number of research projects in 2012: 1,053

- ▶ Research Grants and Contracts: US\$162.6 mn
- ▶ Houses the headquarters of the Asia Pacific Center for Theoretical Physics
- ▶ Research collaboration: High-end research in collaboration with 23 internationally distinguished scholars invited under the auspices of the World Class University project till 2014. In 1996, POSTECH established the Association of East Asian Research Universities with leading universities such as the University of Tokyo and Hong Kong University of Science and Technology, along with 14 other universities in East Asian countries
- ▶ Quality of faculty: All full-time faculty positions with PhD recipients, 60 to 70% of whom were renowned Korean scientists living abroad
- ▶ Faculty includes 16 national scientist award recipients, 115 international academic award or medal recipients, and hundreds of domestic award recipients

RMIT University, Australia and University of St. Gallen, Switzerland

RMIT University, Australia

- ▶ Founded in 1887 with a focus on 5 sectors: Aerospace and aviation, media and communications, health and community services, built environment, construction and infrastructure, automotive transport and logistics
- ▶ Largest provider of tertiary education in Australia, with a student population of 74,000 (including 30,000 international students, of whom more than 17,000 are taught offshore)
- ▶ 79th in the world for employer reputation according to QS University rankings
- ▶ International work placements (vocational training/research projects) to almost 200 students in Europe, Asia and USA

Enablers

- ▶ Placements: Industry projects: Research projects, organizational problem solving projects etc.
- ▶ Partnerships with industry players for teaching, research, consultancy and placements: Aerospace and aviation: Boeing and GKN; Media and communication: Huawei, IBM, CISCO, Siemens

- ▶ Strategic plan 2015: To become a global university in technology and design
- ▶ Work Integrated Learning (WIL) program: To integrate academic learning with workplace application, including:
- ▶ Internship: Paid co-operative education placements (2 semesters/12 months)
- ▶ Professional skills program: Professional skills focuses on technology, design, global business, communication, global communities, health solutions and urban sustainable futures to create work-ready graduates

University of St Gallen, Switzerland

- ▶ Established in 1898, University of St Gallen is specialized in the fields of business administration, economics, law, and international affairs and offers degrees and exec education in management, finance, economics, political science, laws, humanities and social sciences.
- ▶ 50% international faculty and 34% foreign students from more than 80 nations

Outcomes

- ▶ Placements: 100% of graduating class of MBA program was employed in 3 months after completion of the course. Graduates already have a job by the time they graduate and have on an average 1.9 offers per student

Enablers

- ▶ Alumni network: Created platforms for students to meet and build their own network with alumni and company representatives
- ▶ Visiting professors: Invites visiting professors from global universities
- ▶ Continuing education: Concentrates on the training and continuing education of experts and leaders in business, public administration, and law. Created Continuing Education Centre for the same
- ▶ Work experience: 73% of the Bachelor graduates had at least six months' work-experience at the time of their graduation

Source: Institution website

Babson College, USA

Overview

- ▶ Established in 1919, Babson is a private business school offering bachelors and masters courses in business management, accounting, management, and finance
- ▶ Accredited by Association to Advance Collegiate Schools of Business (AACSB) and the New England Association of Schools and Colleges (NEASC)
- ▶ Student population of 3,380, of which 60% are enrolled in undergraduate programs

Metrics

Outcomes

Enablers

Entrepreneurship

- ▶ Ranking: Ranked Number 1 in entrepreneurship for 16 years
- ▶ Home Depot, Zumba fitness, Gerber are some prominent companies founded in Babson

- ▶ Faculty: In faculty of 50, 30 have entrepreneurship experience
- ▶ Established in 1998, The Arthur M. Blank Centre for Entrepreneurship is the centre for entrepreneurial activity at Babson

Employability

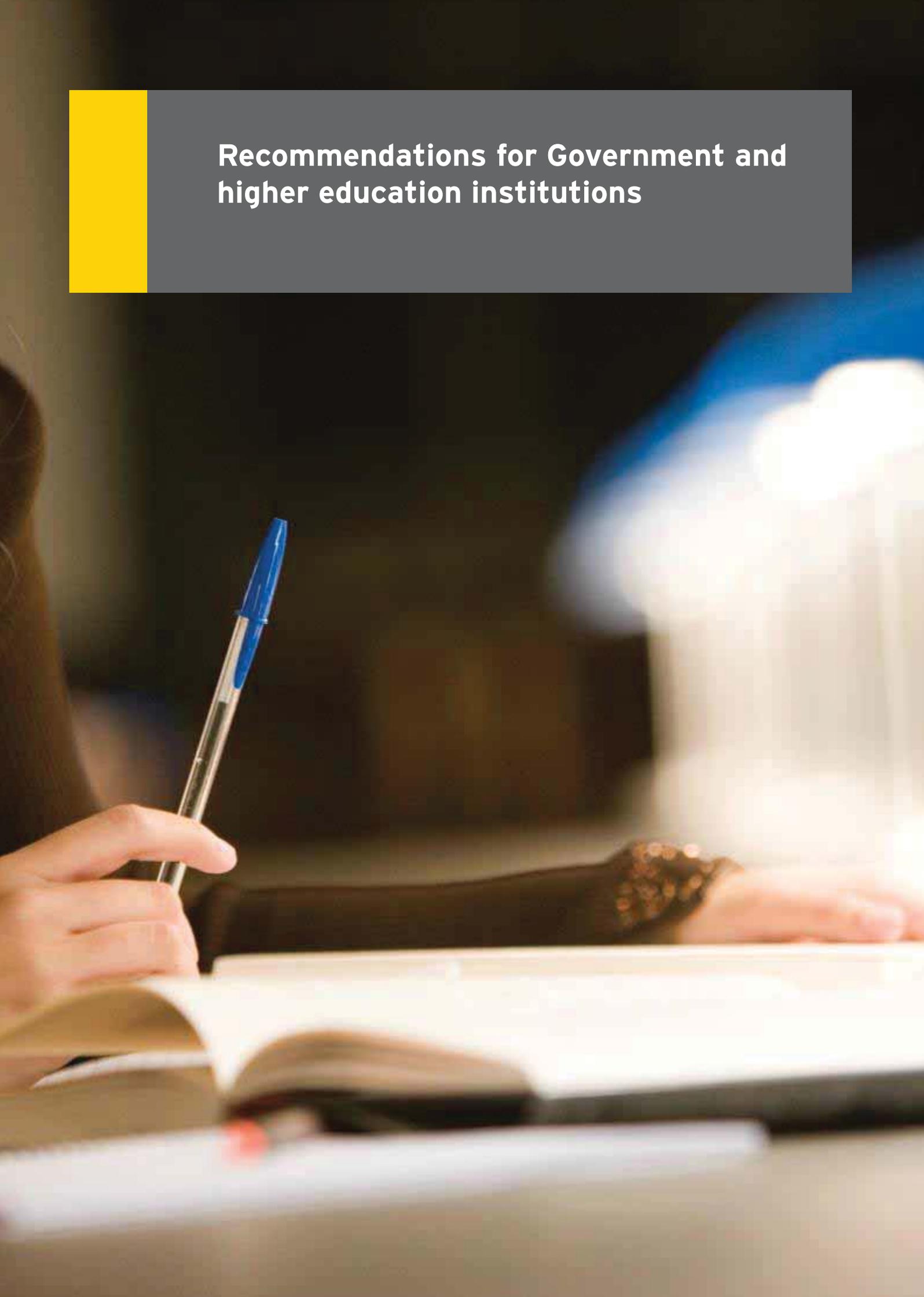
- ▶ 86% students were offered jobs within 3 months of graduation
- ▶ Average base salary: US\$81, 120

- ▶ Employer in residence: On-campus/walk-in hours
- ▶ Corporate support: Discussions around specific job openings with companies, panel discussions with industry executives and involving corporates in personal development plans of students
- ▶ Students as consultants: Give students real-world experience with a team-based consulting projects for different companies
- ▶ Classroom involvement: Guest lectures

Key learnings from globally relevant and competitive institutions

While each institute has its own characteristics and circumstances, there are some common threads that run through the institutions

Aspect	Key enablers
<p>Global recognition, student and faculty mobility, transnational education, International collaborations</p>	<ul style="list-style-type: none"> ▶ Use of data management tools and proper reporting of information such as placements, accreditation and quality assurance practices to ranking organizations ▶ Employing international faculty or leveraging visiting faculty model ▶ Partnerships with international HEIs for student exchange, faculty exchange, joint-programmes and sister school arrangements
<p>Employability</p>	<ul style="list-style-type: none"> ▶ Curricula in sync with industry needs ▶ Recruiting faculty with industry experience ▶ Active industry participation across the value chain including curriculum development, guest lectures, live consulting projects, internships, career planning and counselling, and placements ▶ Work integrated learning programs
<p>Research, innovation and entrepreneurship</p>	<ul style="list-style-type: none"> ▶ Creation of research centres of excellence ▶ Government and institutional collaboration for research ▶ Incorporation of research methodologies and interdisciplinary subjects in curriculum ▶ Hiring research focused faculty and providing rewards for quality research output ▶ Funding support from government and private sources for research and entrepreneurship ▶ Offering entrepreneurship programs ▶ Setting up incubation centres ▶ Industry tie-ups for mentoring start ups ▶ Hiring faculty with entrepreneurial experience

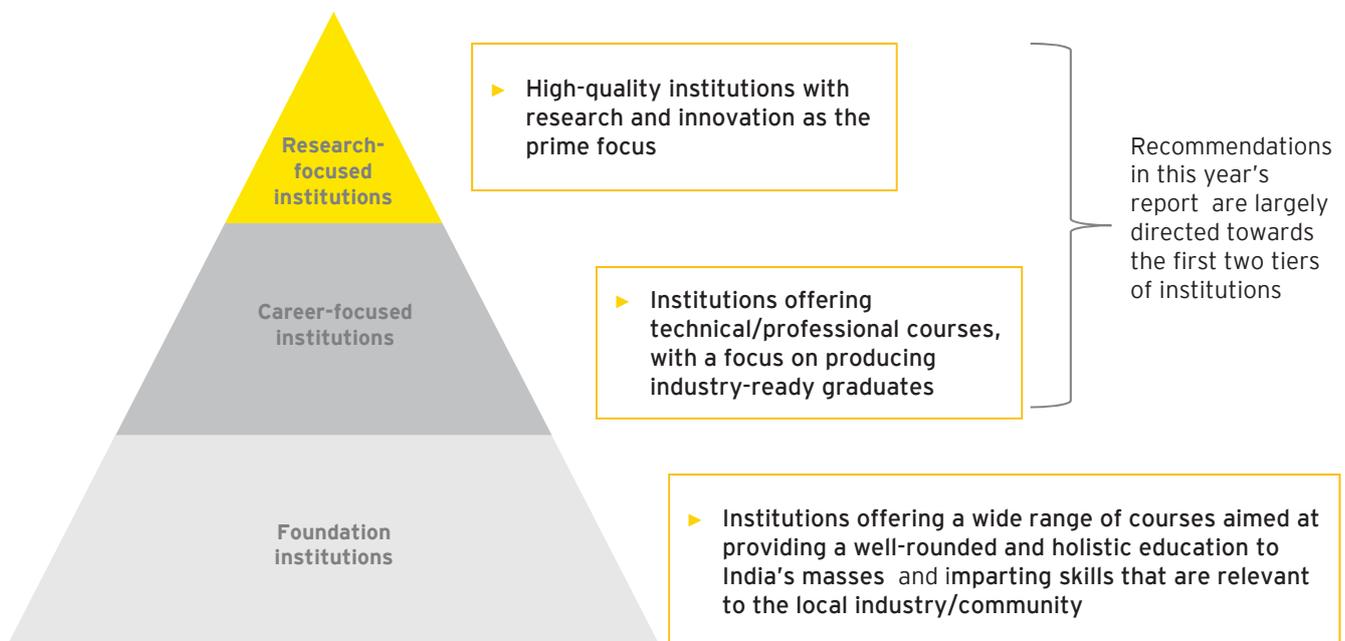
A close-up photograph of a student's hands holding a blue pen over an open book. The student is wearing a dark, patterned sleeve. The background is blurred, showing a classroom environment with a whiteboard and a blue object. The text is overlaid on a grey rectangular background in the upper left corner.

Recommendations for Government and higher education institutions

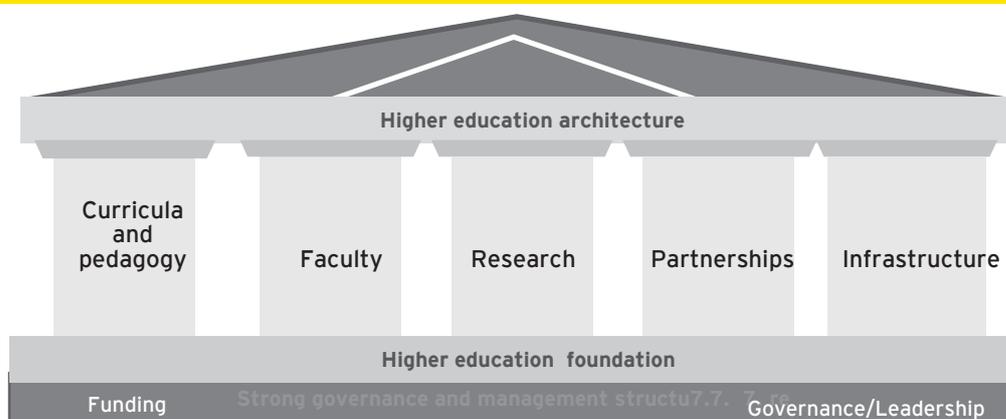
Government and institutions will need to adopt a transformational and innovative approach to make India's HE system globally relevant and competitive

We recognize that the Government, on its part, is taking/planning to take several initiatives to make the Indian HE system more globally relevant and competitive. Nonetheless, we have proposed certain initiatives that the government might want to consider exploring based on industry feedback and learnings from global best practices. In addition, we have made suggestions that Indian HEIs might want to contemplate and consider implementing based on their respective institutional missions, contexts and ambitions.

In last year's Vision 2030 for Indian HE report, we had proposed a three-tiered HE system



Transformational and innovative interventions would be required across all levers of the HE system



1. India prominently positioned on the global higher education map - recommendations (1/2)

1

India prominently positioned on the global HE map

Recently implemented and planned Government initiatives

- ▶ Rankings: MHRD is preparing a “National Framework of Ranking of Universities and Colleges suited to the local conditions, circumstances and requirements”
- ▶ International students: MHRD is planning to establish an entrance exam for international students coming to India. It also plans to increase the limit for intake of international students by Indian HEIs by 15%.
- ▶ International faculty: The Union Government has decided to rope in ~1,000 American academicians to teach in different Indian universities

Recommendations for the Government

Global recognition

- ▶ Incentivise all HEI's to participate in national rankings and accreditation. Identify 100 institutions, both public and private, to work towards improving their global standing, with a target of 20+ institutions in the global 200 by 2030
- ▶ Incentivize globally reputed Indian institutes by providing them greater funding on a competitive basis and link future research funding to HEIs to their quality of research output
- ▶ Enter into mentoring arrangements with countries that have made rapid strides in the global HE landscape
- ▶ Set up a public-private national body that advises and guides top quality Indian institutions to improve their global standing

International students

- ▶ Set up representative offices in target foreign countries to promote Indian HE, equivalent to British council, Education New Zealand, EducationUSA, etc.
- ▶ Universities should have no restriction on intake of foreign students as long as they adhere to norms based on outputs and publish data transparently

International faculty

- ▶ Support best-in-class institutions to recruit international faculty
- ▶ Ease visa and regulatory norms for hiring global faculty

1. India prominently positioned on the global higher education map - recommendations (2/2)

<p>Transnational education</p>	<ul style="list-style-type: none"> ▶ Incentivize quality foreign institutions to set up campuses in India eg. provide single-window, fast-track regulatory clearances, etc. ▶ Encourage setting up of offshore campuses by quality Indian HEIs (say 'A' accredited or globally-ranked institutions) to improve quality perception and gain greater global student share. For example, the EXIM bank can set-up a US\$1 Billion long-term loan facility to fund Indian institutions for setting up campuses abroad
<p>International collaborations</p>	<ul style="list-style-type: none"> ▶ International partnerships should not be restricted to the top 400 globally-ranked institutions, which are predominantly research-centric. "Career-focused" and "Foundation institutions" should be allowed to partner with other institutions that do not feature in the top 400 as per their institutional missions
<p>Recommendations for institutions</p>	
<p>Global recognition</p>	<ul style="list-style-type: none"> ▶ International rankings are highly research-centric (40-50% weight). While building research capabilities and reputation takes significant time, Indian institutions need to focus on improving other metrics, such as infrastructure and employability, in the short to medium term to move up the rankings
<p>International students</p>	<ul style="list-style-type: none"> ▶ Creation of International brand: Open campuses abroad to provide international students a first-hand feel of the high quality of education delivery; establish credibility through student exchange, joint programs, and other collaborations with high-quality international HEIs ▶ International alignment: Secure reputed global accreditations and participate in global ranking processes; accept international test scores such as SAT, ACT, TOEFL, and IELTS for admitting international students ▶ Global promotion: Leverage alumni from/placed in foreign countries for marketing the institute to international audiences; participate in international trade fairs, forums and open houses
<p>International faculty</p>	<ul style="list-style-type: none"> ▶ Institutions should offer best-in-class compensation, high-quality operational and research infrastructure, and academic freedom to attract top notch international faculty ▶ Collaborate with top-end international institutions for faculty development and faculty exchange
<p>International collaborations</p>	<ul style="list-style-type: none"> ▶ Manage international collaborations professionally and ensure adherence to rigorous governance standards and contracts

2. India as a hub for talent - recommendations

2

India as a hub for talent

Recently implemented and planned government initiatives

- ▶ **CIHEC:** The MHRD is in the process of establishing the Council of Industry-Higher Education Collaboration (CIHEC), which will collaborate with the placement cells of Central universities to identify emerging areas based on requirement of industries, to make students employment-ready. The CIHEC will also help to train counsellors at all placement cells for better counselling and placements
- ▶ **KUSHAL:** 100 Knowledge Upgradation Centres for Skilled Human Action and Learning (KUSHAL) are to be established within a year. These Centres will coordinate the skill development initiatives of higher educational institutions
- ▶ **NSQF:** The Government has put in place the National Skill Qualification Framework (NSQF) which seeks to promote vocational education and training among students by facilitating seamless mobility between general and vocational streams

Recommendations for the Government

Employability

- ▶ Reform & re-tool Apprenticeship Act to reflect new realities; make apprenticeship mandatory for most undergraduate programs and tightly integrate apprenticeship with pedagogy
- ▶ Provide tax rebate of 20% to students who successfully complete skills trainings. Any educational service provider opening a skill centre in a backward area should be exempted from Income Tax for the first 3 years
- ▶ Provide tax break to corporate organizations that nominate their employees for higher education programmes either through the continuing education model or a full time program. The fee paid by the corporate for the employees' education should qualify for investment in human resources and hence exempted for tax purposes
- ▶ Launch the National Mission for Faculty Development and provide tax relief of 50% on capacity-building of faculty
- ▶ Facilitate setting up of institutional mechanism for sustained industry-academia engagement by industry chambers e.g. the FICCI-NKFFH model (refer to annexure for details on the model.)

Recommendations for institutions

Employability

- ▶ Engage industry through the value chain by:
 - ▶ Co-developing content/programs related to emerging industries
 - ▶ Inviting guest faculty from industry
 - ▶ Participating in live projects and internships
 - ▶ Participating in institutional Boards
- ▶ Hire faculty with relevant qualifications and industry experience, and train them to ensure effective delivery of curricula
- ▶ Develop soft skills through tie-ups with training providers
- ▶ Focus on lifelong learning through continuing education programs

3. Culture of research, innovation and entrepreneurship - recommendations (1/2)

3

Culture of research, innovation and entrepreneurship

Recently implemented and planned government initiatives

- ▶ **Research:** Under the new system Global Initiative for Academic Networks (GIAN), universities are to provide a list of eminent scholars and researchers in and outside the country, whom they would like to invite as guest speakers/scholars in residence. The Government will support HEIs in inviting these scholars to teach in India
- ▶ The Union Government has formulated a policy under which researchers will have unrestricted access to publicly funded research papers without having to pay for it
- ▶ **Innovation:** The Government has earmarked around INR100 Crore to establish 60 innovation hubs in the country during the 12th Five Year Plan by March, 2017
- ▶ The central government is looking at expanding its India Inclusive Innovation Fund, aimed at promoting grass-root innovations to deliver modest social and economic returns, to US\$1 billion
- ▶ **Entrepreneurship:** The Government proposes to establish an INR10,000 Crore fund that will act as a catalyst to attract private capital by way of providing equity, quasi-equity, soft loans and other risk capital for start-up companies

Recommendations for the Government

Research & Innovation

- ▶ Promote collaborations between top-tier international institutions and Indian higher education institutions and promote the "mentor model" for quality academic research
- ▶ Establish linkages between national research centres/research laboratories and centres of excellence in top universities to promote collaborative research
- ▶ Provide meritocratic and equal access to research grants by public and private institutions
- ▶ Engage industry players to provide funding, mentor research projects and facilitate industrial visits
- ▶ Aim to be ranked among the top 5 countries in terms of the number of PhDs by 2030
- ▶ Incentivize companies through tax breaks to set-up R&D facilities on higher education campuses. Further, all research related grants should be 200% tax deductible
- ▶ Promote funding of individual research. This will incentivize universities to create a conducive environment for research and attract high-quality faculty to their campuses
- ▶ Catalyze, through a fund, the setting up of collaborative research teams between industry and research institutions to find solutions for the five major challenges facing India: Food, Water, Shelter, Energy, and Employment

Entrepreneurship

- ▶ Improve ease of starting and operating an organized business in India. Measures such as simplification of tax procedures, reduction in delays in tax refunds and expediting of Government approvals (land, environment, construction permit, etc.) should be implemented expeditiously
- ▶ Improve the start-up funding ecosystem (angel investing, accelerators, incubators, etc.) through favourable tax policies such as lower Corporate Tax rates for start-ups and exemption from VAT (some OECD countries have this policy).
- ▶ Create virtual incubation centres to support entrepreneurs across India

3. Culture of research, innovation and entrepreneurship - recommendations (2/2)

Recommendations for institutions	
Research & Innovation	<ul style="list-style-type: none">▶ Attract best-in-class research faculty by providing a conducive research environment to them. E.g. by limiting teaching hours, providing freedom to engage in research, offering funds for their participation in relevant conferences, etc.▶ Collaborate with other institutions, research centres, and industry to create relevant knowledge
Entrepreneurship	<ul style="list-style-type: none">▶ Partner with industry to set up and run incubation centres, with industry providing risk capital, mentorship support, etc.▶ Ensure agility in running of incubation centres e.g. appoint leaders with significant industry/entrepreneurial experience; organizational setup should enable dynamic decision-making and risk-taking▶ Allow students who become entrepreneurs after graduation the flexibility to opt for placements in subsequent years if they would like to take up jobs e.g. the Indian School of Business allows student entrepreneurs to opt for placements 2 years after graduation

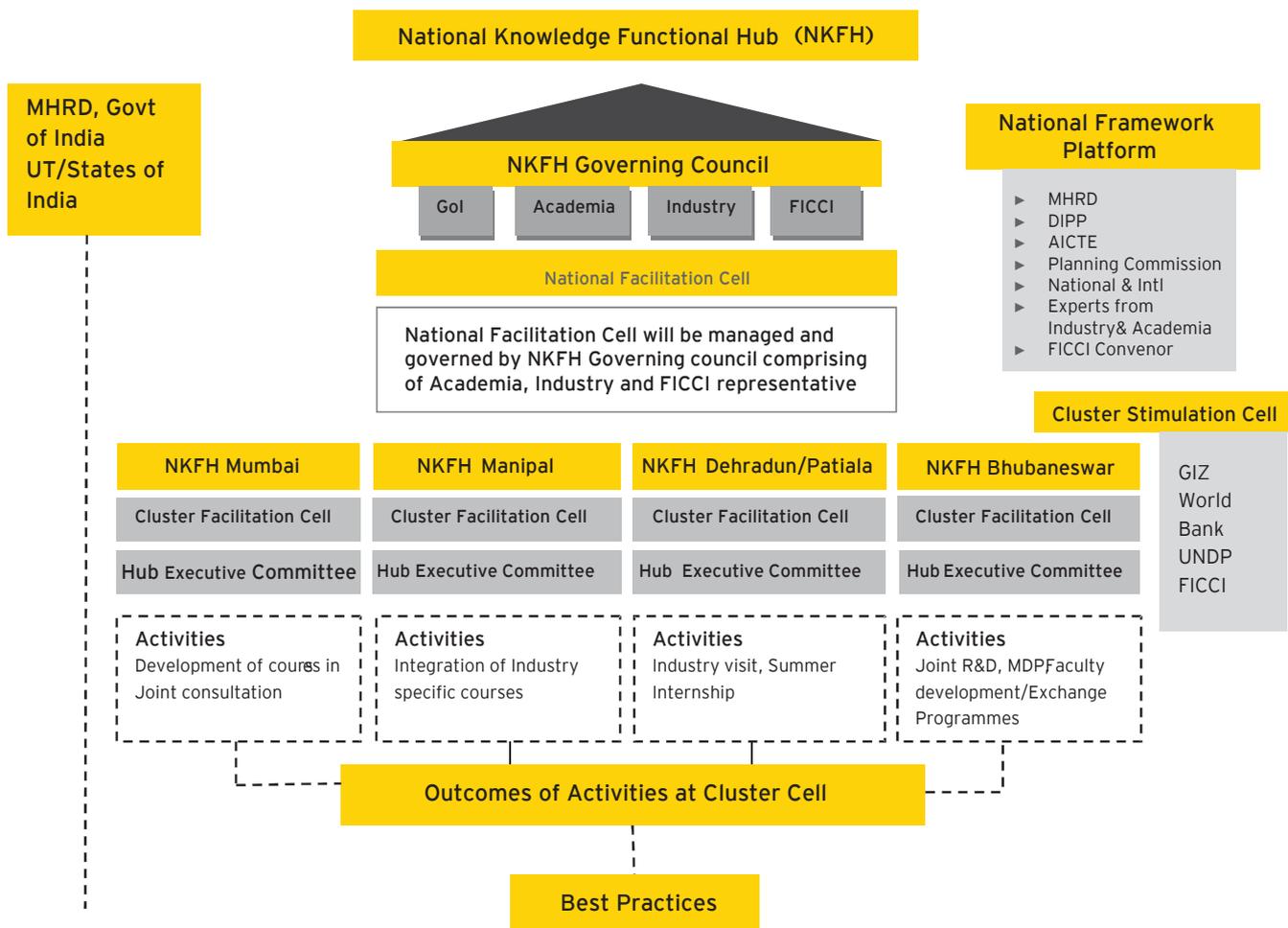




Annexure

National Knowledge Functional Hub (NKFH) aims to enhance the employability of graduates in engineering

- ▶ To improve the quality of engineering education in India particularly to enhance employability of graduates in manufacturing, FICCI initiated setting up of National Knowledge Functional Hub. The concept was piloted in 2011 by FICCI Higher Education Committee together with FICCI Capital Goods Committee.
- ▶ Today NKFH has evolved as an initiative of FICCI, recognised in Twelfth Plan Document. 20 such Hubs have been suggested to be set up across the country by 2017 by the Planning Commission, GoI. The aim is to create a knowledge network of leading universities and companies with Tier II and Tier III institutions and local small and medium industry, with the primary objective of providing hands on professional exposure to fresh engineering graduates through involvement with real-life industrial activities and create an ecosystem for collaborative research and entrepreneurship in our Universities.
- ▶ The institutional arrangement for NKFH is given below



About FICCI's higher education work

FICCI has been playing a pro active role in the Higher Education sector and is supported by the Higher Education Committee, comprising key representatives from leading Higher Education Institutions/Universities, Industry and the Government. The Committee is currently chaired by Mr TV Mohandas Pai, Chairman, Manipal Global Education Services Pvt. Ltd (MaGE and co-chaired by Prof Rajan Saxena, Vice Chancellor, NMIMS University and Mr Avinash Vashistha, Chairman & Geography Managing Director, Accenture - India .

The Committee's primary focus has been on:

- ▶ Providing a platform for policy advocacy and influencing reforms pertinent to the industry needs
- ▶ Creating sustainable linkages between Industry and Academia
- ▶ Facilitating networking and knowledge sharing
- ▶ Promoting collaborative ventures in academic exchanges, industry oriented research/ consultancy and value added services
- ▶ Advocating Internationalization of Indian Higher Education by organizing overseas missions and sting foreign delegations in India.



Acknowledgements

Dr. Pramath Raj Sinha,

Founder, Ashoka University,
Founder and MD, 9.9 Media and
Founding Dean, ISB

Prof. Bijendra Nath Jain,

Vice Chancellor, BITS Pilani

Mr. S Vaitheeswaran,

CEO, Manipal Global Education Services

Mr. Anand Sudarshan,

Director, Sylvant Advisors

Dr. Vidya Yeravdekar,

Principal Director, Symbiosis Society

EY team

Keshav Kanoria
Divya Ramchandran
Ankit Saxena
Ankaj Mohindroo

FICCI team

FICCI Education Lead:
Shobha Mishra Ghosh
Team members:
Rajesh Pankaj
Sunita Mohan
Priyanka Upreti

Glossary

AACSB	Association to Advance Collegiate Schools of Business	KVPY	Kishore Vaigyanik Protsahan Yojana
AICTE	All India Council for Technical Education	KUSHAL	Knowledge Up gradation Centres for Skilled Human Action and Learning
ACE	Action community for entrepreneurship	LBS	London Business School
APRU	Association of Pacific Rim Universities	LMS	Learning Management System
AMRC	Advanced Manufacturing Research Centre	LPU	Lovely Professional University
BITS	Birla Institute of Technology and Sciences	MBA	Masters of Business Administration
BPO	Business Processing Outsourcing	MHRD	Ministry of Human Resource and Development
BSA	Biomedical Sciences Accelerators	MIT	Massachusetts Institute of Technology
CAGR	Compounded Annual Growth Rate	MOOCs	Massive Open Online Courses
CEFR	Common European Framework of Reference	MoU	Memorandum of Understanding
CIHEC	Council of Industry-Higher Education Collaboration	NAAC	National Assessment and Accreditation Council
DOL	Department of labour	NBA	National Board of Accreditation
EDB	Economic Development Board	NEASC	New England Association of Schools and Colleges
EU	European Union	NIT	National Institute of Technology
ETA	Employment & training administration	NPDS	National Patent Development Strategy
EQF	European Qualification Framework	NRF	National Research Foundation
FDI	Foreign Direct Investment	NSQF	National Skills Qualifications Framework
FICCI	Federation of Indian Chambers of Commerce and industry	NUS	National University of Singapore
FY	Financial Year	OBC	Other Backward Classes
GAR	Gross Attendance Ratio	OPT	Optional Practical Training
GDP	Gross Domestic Product	PPP	Public-Private Partnership
GER	Gross Enrollment Ratio	POSTECH	Pohang University of Science and Technology
GIAN	Global Initiative for Academic Networks	PG	Postgraduate
HE	Higher Education	REIC	Research, Innovation and Enterprise Council
HEFCE	Higher Education Funding Council for England	RMIT University	Royal Melbourne Institute of Technology
HEI	Higher Education institution	RUSA	Rashtriya Uchchatar Shiksha Abhiyan
HKUST	Hong Kong University of Science & Technology	R&D	Research and Development
HMCT	Hotel Management and Catering Technology	SC	Scheduled Caste
HRD	Human Resource Development	ST	Scheduled Tribe
IARU	International Alliance of Research Universities	STEM	Science, Technology, Engineering, Mathematics
ICT	Information and Communication Technology	SME	Small and Medium Enterprise
IELTS	International English Language Testing System	SNU	Shiv Nadar University
IGNOU	Indira Gandhi National Open University	TCS	Tata Consultancy Services
IHS	Information Handling Services	TEA	Total entrepreneurial activity
IICs	Inter-institution Centers	TECS	Technology Enterprise Commercialisation Scheme
IIM	Indian Institute of Management	TERI	The Energy and Resources Institute
IISc	Indian Institute of Science	TISS	Tata Institute of Social Sciences
IISER	Indian Institute of Science Education and Research	TLC	Teaching and Learning Centers
IIT	Indian Institute of Technology	TOEFL	Test of English as a Foreign Language
ISB	Indian School of Business	U21	Universitas 21
INR	Indian National Rupee	UG	Undergraduate
INSPIRE	Innovation in Science Pursuit for Inspired Research	UGC	University Grants Commission
IT	Information Technology	UK	United Kingdom
ITI	Industrial training Institute	UKIERI	UK India Education and Research Initiative
IVRS	Interactive Voice Response System	US	United States
KAIST	Korea Advanced Institute of Science and Technology	USDA	US Department of Agriculture
		WIPO	World Intellectual Property Institute

Notes

A series of horizontal dashed lines spaced evenly down the page, providing a template for writing notes.

Our offices

Ahmedabad

2nd floor, Shivalik Ishaan
Near. C.N Vidhyalaya
Ambawadi
Ahmedabad-380015
Tel: +91 79 6608 3800
Fax: +91 79 6608 3900

Bengaluru

12th & 13th floor
"U B City" 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)

1st Floor, Prestige Emerald
No.4, Madras Bank Road
Lavelle Road Junction
Bengaluru-560 001 India
Tel: +91 80 6727 5000
Fax: +91 80 2222 4112

Chandigarh

1st Floor
SCO: 166-167
Sector 9-C, Madhya Marg
Chandigarh-160 009
Tel: +91 17 2 331 7800
Fax: +91 172 331 7888

Chennai

Tidel Park
6th & 7th Floor
A Block (Module 601,701-702)
No.4, Rajiv Gandhi Salai
Taramani
Chennai-600113
Tel: +91 44 6654 8100
Fax: +91 44 2254 0120

Hyderabad

Oval Office
18, iLabs Centre
HITECH City, Madhapur
Hyderabad - 500081
Tel: +91 40 6736 2000
Fax: +91 40 6736 2200

Kochi

9th Floor "ABAD Nucleus"
NH-49, Maradu PO
Kochi - 682 304
Tel: +91 484 304 4000
Fax: +91 484 270 5393

Kolkata

22, Camac Street
3rd Floor, Block C"
Kolkata-700 016
Tel: +91 33 6615 3400
Fax: +91 33 2281 7750

Mumbai

14th Floor, The Ruby
29 Senapati Bapat Marg
Dadar (west)
Mumbai-400 028, India
Tel: +91 22 6192 0000
Fax: +91 22 6192 1000

5th Floor Block B-2
Nirlon Knowledge Park
Off. Western Express Highway
Goregaon (E)
Mumbai-400 063, India
Tel: +91 22 6192 0000
Fax: +91 22 6192 3000

NCR

Golf View Corporate
Tower - B
Near DLF Golf Course
Sector 42
Gurgaon-122 002
Tel: +91 124 464 4000
Fax: +91 124 464 4050

6th floor, HT House
18-20 Kasturba Gandhi Marg
New Delhi-110 001
Tel: +91 11 4363 3000
Fax: +91 11 4363 3200

4th & 5th Floor, Plot No 2B
Tower 2, Sector 126
NOIDA-201 304
Gautam Budh Nagar, U.P. India
Tel: +91 120 671 7000
Fax: +91 120 671 7171

Pune

C-401, 4th floor
Panchshil Tech Park
Yerwada (Near Don Bosco School)
Pune-411 006
Tel: +91 20 6603 6000
Fax: +91 20 6601 5900

Ernst & Young LLP

EY | Assurance | Tax | Transactions | Advisory

About EY

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. We develop outstanding leaders who team to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world for our people, for our clients and for our communities.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. For more information about our organization, please visit ey.com.

Ernst & Young LLP is one of the Indian client serving member firms of EYGM Limited. For more information about our organization, please visit www.ey.com/in.

Ernst & Young LLP is a Limited Liability Partnership, registered under the Limited Liability Partnership Act, 2008 in India, having its registered office at 22 Camac Street, 3rd Floor, Block C, Kolkata - 700016

© 2014 Ernst & Young LLP. Published in India. All Rights Reserved.

ED None

This publication contains information in summary form and is therefore intended for general guidance only. It is not intended to be a substitute for detailed research or the exercise of professional judgment. Neither Ernst & Young LLP nor any other member of the global Ernst & Young organization can accept any responsibility for loss occasioned to any person acting or refraining from action as a result of any material in this publication. On any specific matter, reference should be made to the appropriate advisor.

VS



About FICCI

Federation of Indian Chambers of Commerce and Industry (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.

A non-government, not-for-profit organization, FICCI is the voice of India's business and industry. FICCI has direct membership from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 83,000 companies from regional chambers of commerce.

FICCI works closely with the government on policy issues, enhancing efficiency, competitiveness and expanding business opportunities for industry through a range of specialized services and global linkages. It also provides a platform for sector specific consensus building and networking. Partnerships with countries across the world carry forward our initiatives in inclusive development, which encompass health, education, livelihood, governance, skill development, etc. FICCI serves as the first port of call for Indian industry and the international business community.

Federation of Indian Chambers of Commerce and Industry
Federation House, Tansen Marg
New Delhi-110 001
Tel: + 91 11 23738 760-70 ext 316, 513
Fax: + 91 11 2332 0714, 2372 1504
Email: education@ficci.com