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Session #2

Higher Education - Connecting local
to global markets

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Confederation of Indian Industry (CII) Conference
Education and Skills: Connecting India to the world

Scope

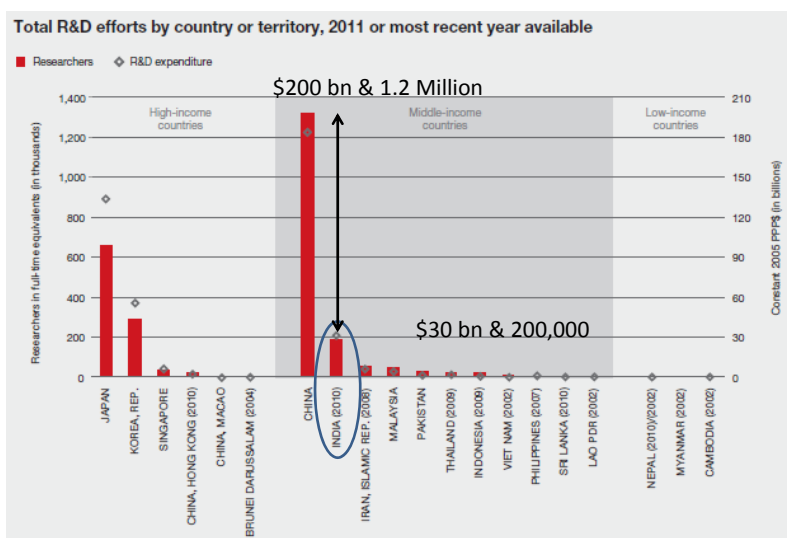
- What would it take for Indian higher education institutions to connect India to the world?
- How to encourage research, technology applications and advancements at a global level?
- How to establish centres of excellence and collaborative research between Indian and Global industry?

Where are we now?

Inputs vs. Outputs

3

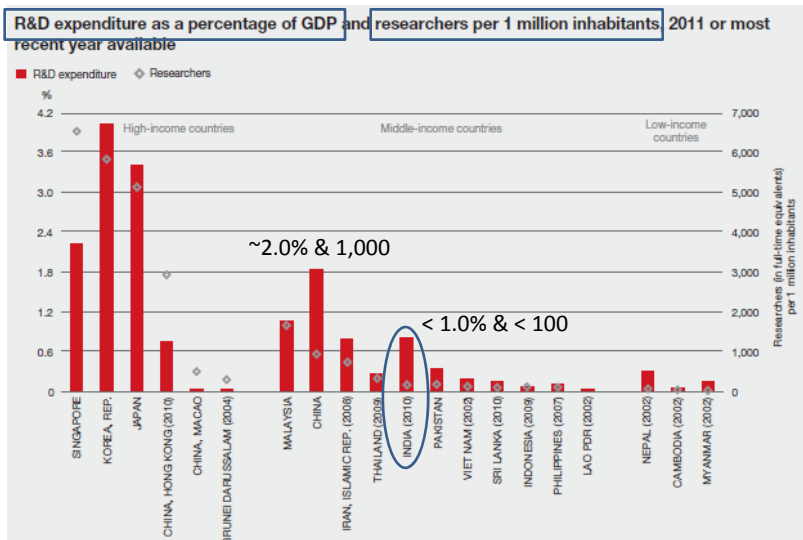
R&D Spend & Manpower (Nos.)



Source: UNESCO Institute for Statistics (2014)

4

R&D Spend & Manpower (Ratios)



Source: UNESCO Institute for Statistics (2014)

5

R&D expenditure as a percentage of GDP, 2001-2011

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
BRUNEI DARUSSALAM	...	0.02	0.02	0.04	...	...	...	...	...	...	...
CAMBODIA	...	0.05	...	...	...	...	...	...	...	...	...
CHINA	0.95	1.07	1.13	1.23	1.32	1.39	1.40	1.47	1.70	1.76	1.84
CHINA, HONG KONG	0.54	0.58	0.68	0.72	0.77	0.79	0.75	0.72	0.77	0.75	...
CHINA, MACAO	0.07	0.07	0.06	0.06	0.09	0.08	0.06	0.10	0.06	0.05	0.04
INDIA	0.73	0.71	0.71	0.74	0.81	0.80	0.79	0.84	0.82	0.80	0.81
INDONESIA	0.05	...	...	...	...	...	...	...	0.08	...	...
IRAN, ISLAMIC REP.	0.55	0.55	0.67	0.59	0.73	0.67	...	0.79	...	...	...
JAPAN	3.07	3.12	3.14	3.13	3.31	3.41	3.46	3.47	3.36	3.26	3.39
KOREA, REP.	2.47	2.40	2.49	2.68	2.79	3.01	3.21	3.36	3.56	3.74	4.03
LAO PDR	...	0.04	...	...	...	...	...	...	...	...	...
MALAYSIA	...	0.65	...	0.60	...	0.61	...	0.79	1.01	1.07	1.07
MYANMAR	0.07	0.16	...	...	...	...	...	...	...	...	...
NEPAL	...	...	...	...	...	...	...	0.05	0.26	0.30	...
PAKISTAN	0.17	0.22	...	...	0.44	...	0.67	...	0.46	...	0.33
PHILIPPINES	...	0.14	0.13	...	0.11	...	0.11	...	...	...	...
SINGAPORE	2.06	2.10	2.05	2.13	2.19	2.16	2.37	2.84	2.43	2.09	2.23
SRI LANKA	...	...	...	0.18	...	0.17	...	0.11	...	0.16	...
THAILAND	0.26	0.24	0.26	0.26	0.23	0.25	0.21	...	0.25	...	...
VIET NAM	...	0.19	...	...	...	...	...	...	...	...	...

Notes: Break in series for Macao Special Administrative Region of China 2010, Japan 2006, Republic of Korea 2007, China 2000 (underestimated before 2000), Indonesia 2009, Malaysia 2006, Sri Lanka 2000 and 2004, and Brunei Darussalam 2004. Partial data for Macao Special Administrative Region of China (excluding business and government sector), Indonesia, Brunei Darussalam, Cambodia, Lao People's Democratic Republic, Myanmar and Pakistan (excluding business sector). Figures for Nepal are based on budget data.

Sources: UNESCO Institute for Statistics database, July 2013 and OECD, Main Science and Technology Indicators database, September 2013
 DataLink <http://dx.doi.org/10.15220/2014/ed/sd2/h13>

Source: UNESCO Institute for Statistics (2014)

6

Output - Reputation

Global Rankings

Number of universities in top world university rankings, 2012

Country or territory	ARWU Top 100	ARWU Top 500	QS-WUR Top 500	THE-WUR Top 400
CHINA	-	28	19	9
CHINA, HONG KONG	-	5	6	6
INDIA	-	1	7	3
INDONESIA	-	-	3	-
JAPAN	4	21	20	13
KOREA, REP.	-	10	13	6
MALAYSIA	-	1	6	-
PAKISTAN	-	-	1	-
PHILIPPINES	-	-	2	-
SINGAPORE	-	2	2	2
THAILAND	-	-	2	1

Note: - denotes zero.

Sources: Academic Ranking of World Universities (ARWU), QS World Universities Rankings (QS-WUR) and Times Higher Education World University Rankings (THE-WUR)

DataLink <http://dx.doi.org/10.15220/2014/ed/ed/2/114>

Source: UNESCO Institute for Statistics (2014)

ARWU Ranking

Number of universities in Top 500 Academic Ranking of World Universities, 2004, 2008 and 2012

Country or territory	2004	2008	2012
CHINA	8	18	28
CHINA, HONG KONG	5	5	5
INDIA	3	2	1
JAPAN	36	33	21
KOREA, REP.	8	8	10
MALAYSIA	-	-	1
SINGAPORE	2	2	2

Note: - denotes zero.

Source: Academic Ranking of World Universities

DataLink <http://dx.doi.org/10.15220/2014/ed/ed/2/115>

7

Output - Research

Research Performance

Number of universities by research performance in broad subject areas, 2008-2011

Country or territory	World class	Excellent	Above average	Below average
CHINA	-	11	65	190
CHINA, HONG KONG	-	4	6	7
INDIA	-	-	8	44
JAPAN	1	5	30	108
KOREA, REP.	1	4	24	42
MALAYSIA	-	1	3	8
SINGAPORE	1	2	3	3
TAIWAN OF CHINA	-	4	29	35
THAILAND	-	-	6	9
TOTAL	3	31	174	446

Note: - denotes zero.

Source: Global Research Benchmarking System (GRBS)

DataLink <http://dx.doi.org/10.15220/2014/ed/ed/2/119>

Source: UNESCO Institute for Statistics (2014)

Research Range

Number of universities by range of research-active areas, 2008-2011

	Range			TOTAL
	Wide	Medium	Narrow	
CHINA	13	22	155	190
CHINA, HONG KONG	2	3	2	7
INDIA	0	3	41	44
JAPAN	7	10	85	102
KOREA, REP.	4	11	27	42
MALAYSIA	0	3	4	7
SINGAPORE	1	1	1	3
TAIWAN OF CHINA	2	7	25	34
THAILAND	0	2	7	9
TOTAL	29	62	347	438

Notes: "Wide": when a university's range of research areas exceeds the threshold in at least 100 niche areas. "Medium": exceeding the threshold in 50-99 areas. "Narrow": less than 50 areas.

Source: Global Research Benchmarking System (GRBS)

DataLink <http://dx.doi.org/10.15220/2014/ed/ed/2/120>

8

Research Output – Niche Areas

Distribution of universities by research performance in niche areas, 2008-2011

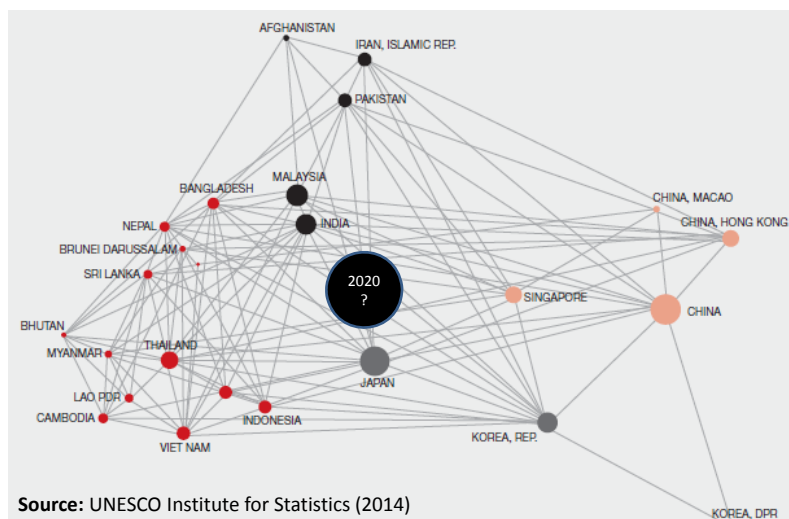
Country or territory	World class (number)	Distribution (%)			
		World class	Excellent	Above average	Below average
CHINA	53	0.9	7.3	22.8	69
CHINA, HONG KONG	22	4.6	16.7	53.9	24.8
INDIA	1	0.1	4.4	21.2	74.3
JAPAN	16	0.5	3.5	27.6	68.4
KOREA, REP.	14	0.7	8	29.7	61.6
MALAYSIA	6	2.6	0.9	11.7	84.8
SINGAPORE	37	17.3	29.4	42.5	10.7
TAIWAN OF CHINA	10	0.8	11.6	41.4	46.1
THAILAND	0	0	4.5	23.8	71.7
TOTAL	159	1.1	7.2	27.4	64.2

Source: Global Research Benchmarking System (GRBS) DataLink <http://dx.doi.org/10.15220/2014/ed/rsd/2/121>

Source: UNESCO Institute for Statistics (2014)

9

Co-authorship Network (2006-12)

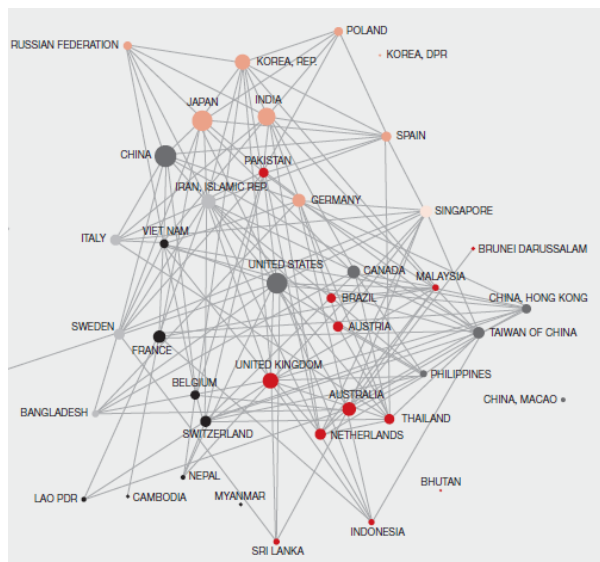


Source: UNESCO Institute for Statistics (2014)

Notes: The map was re-produced from the output of VOS Viewer (<http://www.vosviewer.com/>), to create and explore maps based on network data. The distance between two countries reflects the strength of the scientific cooperation between the countries. A smaller distance indicates a stronger relation. The colours reflect different clusters based on a clustering routine implemented in VOS viewer. The size of circles reflects the weights of a country in co-authorship.

10

Global Co-authorships (2008-12)



Source: UNESCO Institute for Statistics (2014)

11

Where do we want to be?



• Inputs

- Increase R&D Spend to \$100bn (~1.5% of GDP)
- Increase research manpower to 0.5 million

• Outputs

- At least 10 universities in Top 500 in the world
- At least 20 'Above Average' in research output
- At least 10 with 'Medium' research range
- At least 2 at 'World Class' in niche research
- Double the global co-authorship network

12

How do we get there?

Dimension	Actions
Organization Structure & Management Strategy	<ul style="list-style-type: none"> • Introduce strategic planning & advisory teams • Establish centres of excellence & international campuses • Performance agreements and key performance indicators • Involve staff in evaluation and accreditation exercises
Research Infrastructure & Incentives	<ul style="list-style-type: none"> • Increase outputs, quality and citations • Reward faculty for publications in top-tier journals • Require doctoral students to publish before graduation
Student Recruitment & Training	<ul style="list-style-type: none"> • Right balance of undergraduates to graduates • Proactively recruit international students • Increase exchange or study abroad activities
Faculty Selection & Development	<ul style="list-style-type: none"> • Recruit scholars with the right training and attitudes • Create separate research & teaching tracks, if needed • Identify, retrain and redeploy weak performers • Recruit international academic staff, if possible
Accreditations & External Relations	<ul style="list-style-type: none"> • Seek relevant international accreditations • Communicate (Website, Newspapers, Newsletters etc.)

Summary

- What would it take for Indian higher education institutions to connect India to the world?
 - Higher Quality, better infrastructure, alliances and partnerships, more competition
- How to encourage research, technology applications and advancements at a global level?
 - More incentives for joint-research, international conferences, joint-degrees, exchange programs & visits
- How to establish centres of excellence and collaborative research with Global industry?
 - Use extensive NRI network, academic alliances, focus on select industries e.g., IT, Biotech, Nanotech etc.

Thank You...

15