Table 1. Skill development programmes/schemes offered by the Government under various ministries

Ministry	Schemes/programmes
Ministry of Micro, Small and Medium Enterprises – for women entrepreneurs	Tread-Related Entrepreneurship Assistance and Development Scheme for Women (TREAD)
	Micro and Small Enterprises Cluster Development Programme (MSE-CDP)
	Credit Guarantee Fund Scheme (CGTSI)
	Support for entrepreneurial and managerial development
	Exhibitions for women under promotional package for micro and small enterprises
	Skill upgradation and quality improvement Scheme: Mahila Coir Yojana
Ministry of Labour and Employment	Modular Employable Skills (MES) under Skill Development Initiative Scheme (SDIS)
Ministry of Housing and Urban Poverty Alleviation	Swarna Jayanti Shahari Rozgar Yojana (SJSRY)
Ministry of Rural Development	Swarnjayanti Gram Swarozgar Yojana
	Aajeevika Special Projects (NRLM)
Ministry of Women and Child Development	Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG; 'SABLA')
Ministry of Human Resource Development	Jan Shikshan Sansthan (JSS), National Literacy Mission Authority

for women, 136 private ITIs and 726 women's wing in general Government ITIs and 118 women's wing in general private ITIs. Training seats offered for women in these ITIs/wings were 74,124. In addition, about 30% seats are reserved for women in general ITIs.

In the Central Government, around 20 ministries are closely involved in skill development (Table 1). These ministries operate in one of two ways: (a) through setting up their own training capacity in specific sectors, or (b) through providing per-trainee costs of training for specific target populations. Most State Governments have also set up State Skill Development Missions as nodal bodies to anchor the skill development agenda in the states. They are expected to play a significant role in skill development, through identification of key sectors for skill development in the states; as well as coordinating with Central ministries and State Line Departments, as well as industry and private training organizations. Skill development has also been given priority during the 12th Five-Year Plan to cater to the expanding workforce in the country[2].

In spite of the existing plans and programmes, many in India are not aware of these Government initiatives. Also, non-availability of transportation facility, accommodation in hostels, distance from home and other family constraints further hamper women's participation. To boost women's participation in vocational training programmes, there is a need to create awareness about these programmes and training facilities available in India. Secondly, academic institutes should be involved: (i) to study and assess the performance of existing Government programmes by conducting surveys in urban, rural and tribal areas; (ii) to identify key areas for applying the schemes effectively and (iii) make recommendations to the Government. There is a need to identify gaps in the existing programmes with respect to market trend and industry demand for wage-employment based on market survey, requirement of industry and employers.

1. Jamal, T. and Mandal, K., *Curr. Sci.*, 2013, **104**, 590–595.
2. Draft 12th Five Year Plan (2012–17), vol. 3, pp. 124–163.

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India's ranking in materials research

Recent Global Research report on 'Materials Science and Technology' by Thomson Reuters provides information on materials research output of several countries including India. Table 1 of the report reproduced in this letter provides information on ranking of 20 institutes/universities by output (number of papers), citations and citations impact for materials science research for the period 2001–2011. In this report only IITs of India are identified as single institution contributing to materials science research.

In Table 1, first column IITs occupies 5th position with a total of 4522 papers, where as the Chinese Academy of Sciences (CAS) occupy number one position with a total of 14,019 papers. In this ranking based on number of papers, none of the US based institutes figure, since rankings is restricted to the institutes having contributed a minimum of 2500 papers. Further column 4 of Table 1, list institutes based on total number of citations. In this kind of ranking CAS occupies first position with a total citation of 104,104. IITs moves down to last position (20th rank) with a total citations of 22,297. Interestingly only six US institutes figure based on the total citations count. Of these six, MIT is ranked number 5. Column 7 of the table list 20 institutes based on citation impact (average number of citation per paper). In the ranking based on citation impact, University of Washington ranks no. 1, with an impact factor of 30.41. Further, it is instructive to note that both CAS and IITs do not figure in this ranking based

Table 1. Ranking of institutes and universities by papers (articles and reviews), citations and citation impact for materials science research indexed in *Web of Science*, 2001–2011 and World ranking of universities by Times Higher Education for the year 2012

Institute	Papers	Rank	Institute	Citations	Rank	Institute	Impact	World ranking by Times Higher Education
Chinese Academy of Sciences	14,019	1	Chinese Academy of Sciences	104,104	1	University of Washington	30.41	24
Russian Academy of Sciences	6,769	2	Max Planck Society, Germany	56,720	2	University of California Santa Barbara	27.41	35
Tohoku University	5,511	3	Tohoku University	40,135	3	University of California Berkeley	26.58	9
Tsinghua University	5,129	4	NIMS, Japan	36,578	4	University of Groningen	25.07	89
Indian Institute of Technology	4,522	5	MIT, USA	35,329	5	Harvard University	24.46	4
Harbin Institute of Technology	4,059	6	AIST, Japan	33,868	6	MIT	21.61	5
AIST, Japan	4,052	7	University of California Berkeley	33,460	7	University of Southern California	21.11	56
NIMS, Japan	3,952	8	National University of Singapore	31,740	8	University of California Los Angeles	19.23	13
Osaka University	3,618	9	Tsinghua University	31,698	9	Stanford University	18.34	2
Central South University	3,464	10	University of Cambridge	27,909	10	University of Minnesota	17.35	47
Shanghai Jiao Tong University	3,380	11	CSIC, Spain	27,285	11	Max Planck Society, Germany	17.31	NA
Max Planck Society, Germany	3,277	12	Georgia Institute of Technology	27,201	12	Georgia Institute of Technology	17.02	25
CSIC, Spain	3,191	13	Osaka University	26,217	13	Northwestern University, USA	16.39	19
University of Science and Technology, Beijing	3,065	14	Seoul National University	25,564	14	Cornell University	16.06	18
Univesity of Tokyo	2,960	15	CNRS, France	25,132	15	University of Michigan	15.70	20
CNRS, France	2,953	16	University of California Santa Barbara	24,343	16	University of Massachusetts	15.62	72
Zhejiang University	2,721	17	University of Washington	24,240	17	Drexel University	15.53	226
Seoul National University	2,560	18	Pennsylvania State of University	24,086	18	Eindhoven University of Technology	15.29	114
Kyoto University	2,541	19	University of Tokyo	24,080	19	University Pierre and Marie Curie	14.96	81
Tokyo Institute of Technology	2,520	20	Indian Institute of Technology	22,297	20	Rensselaer Polytechnic Institute	14.71	174
						Chinese Academy of Sciences	7.42	?
						Indian Institute of Technology	4.93	?

on citation impact. Of these 20 institutes, 16 are US based. There is not even a single institute from Asia finding a place in this ranking.

In order to examine the correlation between ranking based on citation impact and world class status, I have taken the data on world ranking of universities as reported by the Times Higher Education for the year 2012 and shown the ranking of all these 20 institutes in column 9 of Table 1. From the Table 1, it is clear that 14 out of 16 US based institutes having high citation impact in materials research also have ranking below 100 indicating good correlation between high citation impact and Times Higher Education ranking. Rensselaer Polytechnic Institute (RPI) and Drexel Universities which occupy 20th and 17th position, have a world ranking of 174 and 226 respectively. The European institutes, University of Groningen and University of Pierre and Marie Curie also figure with in 100 rank, whereas Eindhoven University of Technology ranks 114. The Max Planck Society of Germany is not included in the scheme ranking by the Times Higher Education, hence its ranking is not available.

Based on available data, citations impact of IITs is calculated to be 4.93. Incidentally, recently Prathap[2], in his paper on ranking of top 20 institutions in engineering, IITs have been assigned a ranking of 20 with an citation impact of 3.57. This indicates IITs ranking in engineering is lower compared to their ranking in materials science research.

In the context of data presented above, it is necessary to reflect on some of our policy formulations/documents in the area of higher education/research for the 12th Plan. In his report on corporate participation on higher education, Narayna Murthy[3] recommends an investment of US$ 8 billion over the next 5 years and targets for 20 new world class universities. Similarly, Kakodkar committee[4] envisages admission of more than 10,000 Ph D scholars in to IIT system by 2020 compared to present 1200 or so for the purpose of transforming IITs into world class. It remains to be seen, if all these grand plans/measures if implemented will help IITs and other premier institutes securing much clamored tag of 'World Class' institutes. If so, how many institutes/universities in India will join the league of world class? We all have to wait until 2020, if not by 2017.

1. Adams, J. and Pendlebury, D., Global Research Report, Materials Science and Technology, June 2011; also in: www.eemm.csic.es/eng/news/grr-materials science.pdf
2. Prathap, G., *Curr. Sci.*, 2011, **11**, 136.
3. Committee on Corporate Participation in Higher Education: Report of N. R. Narayana Murthy Committee, submitted to Planning Commission, 2012; www.sarkaritel.com/corporate-participation-in-higher-educat
4. Taking IITs to Excellence and Greater Relevance, Report of Anil Kakodkar Committee, submitted to MHRD, April 2011; www.iitsystems.ac.in/iit-frame/Kakodkar Committee Report.pdf

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Conservation of *Dugong dugon* (sea cow) in Gulf of Mannar

Dugong dugon (dugongs) is probably one of the few living marine mammals surviving in pockets all around the Indian Ocean to the western part of the Pacific Ocean. These marine mammals are herbivores which spend their full life in the sea. They are the only extant species of the family Dugongidae[1]. All extant members of order Sirenia (including the dugong) are listed as vulnerable to extinction[2]. All populations of dugong are also listed in Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and in Appendix II of the Convention on Migratory Species (CMS). Dugongs are more closely related to elephants than marine mammals such as whales and dolphins, but their closet aquatic relatives are the manatees. The word 'dugong' means 'lady of the sea'[3]. Adults grow to about 2.5–3.5 m long, and weigh about 230–420 kg (ref. 4). They are generally solitary, travel in pairs, or associate, only in small groups (3–6 individuals)[5]. Their main food is sea grass (family Potamogetonaceae, Hydrocharitaceae, Cymodoceaceae); about 25–30 kg consumed per day. Female dugongs in season, attract the attention of several males, one or two of which will eventually mate with her. The young is born after a gestation period of 12–14 months. The mother will not calve again for periods of between 2.5 and 7 years. They have been known to live for more than 70 years in their natural habitat. Dugongs are generally found in warm waters around the coast with large numbers concentrated in wide and shallow protected bays located at a depth of around 10 m (33 ft)[6]. Populations of dugong exist in the waters of 37 countries and territories. Australia is home to the largest population; they also exist in the Gulf of Mannar and the Palk Strait between India and Sri Lanka, but are being seriously depleted. They are now endangered and subjected to a range of human threats in the Gulf of Mannar. Das and Dey[6] suggest habitat loss as the main reason for population decline. This is attributed to the increasingly heavy boat traffic, toxic run-off from agricultural biocides, pollution from urban centres, oil spillage, bottom trawling and dredging and the commercial harvest of sea grasses[7]. Fishing activities around the Indian, Andaman

Figure 1. Dead *Dugong dugon* in Kilakkarai, Tamil Nadu.