

Innovating the Managers in Indian Higher Technical Education

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Abstract *Innovation in any place, including educational organisations, is directly proportional to the attitude of top and senior management of that organisation. Educational innovation in India needs to be regarded as one aspect of a multi-dimensional effort for the transformation of Indian education system and then Indian people. Almost 60 per cent of India's people are under 25 and, as the world's largest democracy; it will be forced to respond to their desire for higher education. However, Management, as it is practiced today, is more about the status than about improvisation or creativity. Large scale reforms are currently being tried in the education sector. And the decisions of the University, University Grants Commission and the government are very vital in this regard. Despite the current decade being a 'decade of innovation', nothing much seems to be happening. To inculcate innovation, first the policy makers must transform the policies and regulations to make the institutions and their management more innovation-friendly. Innovation in education is more about combined initiatives than only force compulsion by regulation. A right blend of continuity and change management is required for managing the innovation in higher education system in India.*

Keywords Continuity and change management · Educational organisations · Higher education · Innovation-friendly

Introduction

Indus Valley Civilization, where the planned cities' roads, drains, public places and docks, granaries and depiction of bejewelled people on clay seals show an unmatched mastery of technology, maths and economics. This is where the roots of Indian knowledge and wisdom began.

India has been an epitome of innovation and discovery since the verge of the civilization, from producing two philosophies and religions—Jainism and Buddhism, to Aryabhatta heading a school of astronomy and mathematics in modern day Bihar to Brahmagupta in Ujjain who introduced negative numbers and developed the use of zero. Indian education system was forward, creative and innovative.

Today, Indian education system is by far the largest capitalized space in India with government spend of \$30 billion (2006; at ~3.7 % of GDP, it is in line with the global average). The extent of the spends have created one of the 'largest' education networks globally of approximately 1 m schools and 18,000 higher education institutes (HEIs) in India, home to the largest population within the age group 0–24 years (Vora and Dewan 2009). Now India has more than 33,000 colleges (University Grants Commission, UGC 2012).

However, when it comes to innovations, India severely lags behind. The ignorance of the masses and the dominance of the status-hierarchy in socio-economic life are factors that breed a suspicion about innovations. Disturbance of traditions builds up anti-innovation groups whose attack is often directed not only against the innovative projects but against their promoters as well (Naik 1974).

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The government, even though is trying to put in efforts in the area.

This paper explores the idea of innovation for the policy makers or the managers of the Indian education system so as to transform the higher education sector into a more innovation-friendly. As the sum and substance of innovation is ‘people involvement’, and that involvement would come about only through accountabilities defined which would need to be redefined from time to time which can be only done by policy makers.

Innovation and the Role of Management

The need for understanding and managing innovation appears to be widespread. Several researchers have discussed the importance of innovation such as Ouchi (1981), Pascal and Athos (1981), Peters and Waterman (1982), Kanter (1983), and Lawrence and Dyer (1983).

Perhaps there are as many definitions of innovation as the number of researchers in the field around the world. However, the simplest one is given by Drucker (1986), “*Change that creates a new dimension of performance*”. While Schmittlein and Mahajan (1982) elaborated that innovation does not relate just to a new product that would come into the marketplace, it can occur in processes and approaches to the marketplace.

An Innovation is a new idea, which may be a recombination of old ideas, a scheme that challenges the present order, a formula, or a unique approach which is perceived as new by the individuals involved (Zaltman et al. 1973; Rogers 1982).

Strategy is integral to every part of business, including innovation. Without a corporate strategy focussed on innovation, it will be misdirected and unguided. Management brings that overarching corporate strategy to the table, and from there innovation can emerge to achieve the defined goals of the organization. For example, Nokia, once a successful innovator in the Indian market, missed out on the huge opportunity to sell handsets with a dual SIM-card capability. Simply because senior management in the developed world, where phones are bundled with the usage plan of a particular operator, could never understand why anyone would want to use two SIM cards in a single handset. Similarly, in case of Indian Technical Higher education, management has to strategize to achieve innovation.

Management’s role is to ensure that it institutionalizes the expectation that managers will lead the continuous improvement of their teams and that time is allotted for them to lead improvement initiatives. Innovation should be an expectation of all workers and an accountability of all managers. Management faces a very tricky balancing act. On the one hand, they should stimulate creativity and

innovation, by creating an environment for experimenting that allows failure. On the other hand, management needs to have a process in place to stimulate productive ideas and weed out the ‘bad ideas’.

Indeed, innovation looks different at varying levels of the organization, but continuous improvement must happen at all level of the organization. When a teacher employee discovers a different way of explaining theory of relativity, the result is more students’ understanding the concept. This is innovation at ground level—increased efficiency.

Indian Higher Education Perspective

While the higher education institutions today are facing the issue of responding continually to an environment which is increasingly dynamic, complex and uncertain as a consequence of demographic changes, a more global economy, the “hypercompetition” or knowledge-based competition (Daft and Lewin 1993). There is an ambiguous duality of Indian private higher education sector; as they cannot earn profits, however they still have to run as an enterprise. Further with the sudden growth of higher education system, especially in the private domain, the question of innovation and creativity has been lost.

While on one hand, in an effort to increase research investment, the Science and Technology Ministry has announced the Indian Innovation Act. Only one institution from India (IISc) has made it to the top 500 in the ARWU 2011 rankings, which is prepared by the Shanghai Jiao Tong University. Although, plenty of people in India still believe that Indian Institute of Technology (IIT) is the ultimate portal to success; none of the IITs are featured in this list. Further, in 2008, IIT Kharagpur was ranked at 301–401, while in 2009 it slipped at 402–501 position. Not just in ARWU rankings, even in the QS World University Rankings, a similar trend is shown. Table 1 below demonstrated the falling in ranking of almost all high ranking institutions of India over the past 3 years.

Table 1 Rankings of Indian universities

Name of the universities/institutions	2010	2012
IIT Delhi	202	212
IIT Bombay (Mumbai)	187	227
IIT Madras (Chennai)	262	312
IIT Kanpur	249	278
IIT Kharagpur	311	349
University of Delhi	371	401

Source QS World University Rankings (2012)

The following issues seem to be addressed by the policy makers and educationists to fully understand and transform the Indian education sector to inculcate creativity and enhance innovation.

- *Resistance to change* In terms of several indicators, India is now trailing behind several nations like China and Malaysia over which it had a clear lead even two decades ago. This is not because we are doing something differently from what we did in the 50s and 60s but precisely because we are not doing anything differently (Basu, Education Times 31 May 2010). It may be of importance to note that several government bills are in the pipeline, but are being opposed by those affected by them. The Malpractices Bill is facing resistance from the institutions that are engaged in collection of capitation fees and making false claims. The institutions running substandard programmes are criticizing the Accreditation Bill. The National Commission on Higher Education and Research (NCHER) Bill is facing opposition from those concerned with the State autonomy and unfounded apprehensions of a single central authority. The opposition to the Foreign Education Bill is partly based on political and ideological consideration and partly by the institutions currently running bogus foreign programmes.
- *Core competence* Major skills and technology are put in by the companies to create a competitively unique point and for a specific value addition for their customers. These skills require investments as well as skilled manpower which act as a hindrance to change in long run. Here, the core competence may be attributed majorly to the core/popular subjects offered by the institution, e.g. Engineering for IITs etc. These offer resistance in terms of changing the courses/addition of courses as they are unsure of the customer response to it.
- *Lack of culture for research* The Economic Times (2011) noted the loopholes in the system highlighting that the country lacked the environment for research and discussion.
 - The work culture in the entire education system is more dependent on additional help such as coaching and additional vocational diplomas. Therefore, the emphasis on education and in-depth teaching is lost at times.
 - The institutions still stick with the traditional way of classroom teaching.
 - Further, educationists have started seeing research as just a formality to do PhD, rather than looking it as a true research. Most of the students find nothing extraordinary in their research and even number of patents are lesser. The Indian Institute of Technology-Madras (IIT-M) has won a national award in intellectual property for an educational institution securing highest number of patents, with 78 patents to its credit during previous 5 years which is negligible in comparison with the MIT, USA where the number of patents issued in 2011 were 153. This is shown in Table 2.
- Patents won or doctoral programmes available are embarrassingly small in number. In 2009, the average number of research papers published by technical institutes dropped 10 % to 145 with only one in three institutes filing patents in the last 2 years. Among these institutes, the number of patents obtained was 2.7 patents per institute in year 2011.
- *Government policies and legislation* Sen (1970) boldly said that the grave failures in policy making in the field of education require the analysis of the characteristics of the economic and social forces operating in India, and response of public policy to these forces. The Times of India noted that the root cause of the problem was India’s “excessive bureaucratic control in higher education”. We may further venture into it by understanding the following viewpoints:
 - *Large number of governing bodies* There are several governing bodies that overlap each other with respect to laws and policies. Most of the times, one institution is recognized by one of the councils and not recognized by the other. Maintaining all the parameters of all the councils becomes extremely long and tiresome process for any institution (please refer Appendix).
 - *Red-tapism* Government universities due to its rigid culture of sticking to the traditions etc. are unable to maintain the pace of change in present offerings to the new-age students.
 - *Financing* Governments and businesses in India are stingy when it comes to financing fundamental research or hiring PhDs, limiting the scope for research and knowledge creation. Funds for primary research are tiny and hard to come by. Further, increasing value of senior scientists and faculty,

Table 2 Research data of two institutes

Institutes	2007	2008	2009	2010	2011
MIT, USA	Data not filled	Data not filled	Data not filled	Data not filled	153
IIT Madras	In 5 years 78				

Source Compile from institutes websites 2011 by author



they prefer to join the universities abroad for better compensation and security.

- *Lack of industry–academia collaborations* The government regulations have not allowed any mergers and acquisitions in the education sector, however, an increasing number of universities are collaborating with foreign universities in courses such as dual degrees etc. However, Industrial collaborations are still at its infancy stage. Translating research into something beneficial for the industry has not been nurtured in the society. A whole-of-industry approach will be required to secure future skills needs under public private partnership. Skills formation strategies are long-term processes that help align skills supply, workforce development and business strategy through the collaborative action of industry, government, education and training sectors (CII Karnataka 2008).
- *Lack of sustaining regulations* It should be of grave concern that most of the institutions require our faculty to have PhDs, but there are no regulations for the organizations to stipulate proof of technological competency or teaching excellence in their new hires.
- *Lack of E-learning* The information and communication technology (ICT) changed the way people were taught, the virtual universities and online courses have changed the imparting of education itself. A teacher sitting in one place can teach and interact with students from the various parts of the world. However, only a few Institutions such as IIMs have adopted this technology and that too, only for certificate courses. There is a lack of degree courses that are recognized under the E-learning format. The government should recognize such an important aspect of education.

After understanding the above aspects, it wouldn't be incorrect to say, that the largest hindrance to innovation-friendly atmosphere in the higher education sector is the "Lack of Culture for Innovation" and our own government legislations and policies.

Recommendations for the Transformation of the Policy Makers

After considering the above limitations, it becomes imperative for us to explore the idea of transforming the higher education sector of India to be more innovation-friendly and creativity oriented. The main hindrances in innovation environment of India remain as the government

legislations and policies and the lack of culture for innovation. It must be understood that before we can educate for innovation we have to put down solid educational foundations; which can only be done by strong and apt policies by the government. A culture of innovation and creativity requires organizations to break down functional barriers (Krishnamurthy 2011).

To truly make the entire education sector innovation and creativity centred, we must focus on the two main areas that cause the maximum weakness in the innovative form of education. The following changes are suggested to overcome the

Transformation of the Government Policies

The government should focus on addressing the broad policy issues that undermine our higher education system rather than trying to micro-manage the institutions of higher education. It should act as a governing body and must focus on the following issues:

- *R&D investment* Research required years of inputs and raw materials, the government must invest in at least the infrastructure to create new knowledge, primarily in engineering, medicine and the natural sciences. It is of interest to note that MIT, USA spends over \$17.6 million per year on investments on the patents. R&D expenditure in India is still low at 0.81 per cent of GDP compared to 1.13 per cent in China and 2.60 per cent in US. This is shown in Table 3.
- *Creation and capacity-building* Creation and capacity-building of highly skilled group in the labour force to be used in research and development.
- *Accountability* There must be greater alignment between the incentives to people across the higher education system and appropriate quality metrics—e.g. in a research-led university, the choice of a vice chancellor and his compensation should be linked to his contributions towards creating a climate for research in the university. Government ensure that the research going on in various universities must be productive, rather than a work just to get a degree. It must hold the guides and the universities accountable.

Table 3 R&D investment in % of GDP

Countries	Investment in % of GDP
USA	2.6
China	1.13
India	0.81

Source compile from MIT website 2011, The Times of India in its editorial headlined "Aim for World Class" by author

- *Product markets establishment* Government must ensure that the patents and new researches are adopted by the industry and helps the industry in every way it can. For example in MIT, USA over \$155 million in revenues were generated only with the incomes and royalties. In India industries are not contributing to innovation in their area of product development/innovation as there is no any type of rule/compulsion/expectation.
- *Accreditation* Government's role should be focused on creating a strong and transparent accreditation system that would help students and parents assess the quality of higher education provided by different institutions. However, accreditation must not be just dependent on fulfilling positions. Rankings must be based on the actual work of the institution, actual development due to the director/vice chancellor of the institution.
- *Cost effective education* There is need for "frugal innovation" in India that could provide low-cost solutions to benefit those at the bottom of the pyramid in India such as developing universities based in cyberspace; E-learning and competent distance education programs. Knowledge Commission report has initiated some measure but its long way to go in present pace of development.
- *Hub and spoke system of networking* The government must set up data centres throughout the nation, the premises for which the government would provide to entrepreneurs free of cost, thus setting up data "hubs" that could be accessed by the "spokes," including local universities or technical education institutes.
- *Incubation activities* India must tap the potential of other projects, encouraging innovation would not just mean a research at IIT, but also individual researches must be given respect and adequate infrastructure.
- *Technology transfer* The legal and commercial aspects of innovative activities must be taken care by the government and the researchers given their due.
- *theirs.* Rather than micro-managing, they must govern these institutions and see to it that optimum utilization of funds is taking place.
- *Diminishing hierarchy* Designing more non traditional study spaces and practices also help to foster a culture of innovation within organizations. Almost every member in an organization, irrespective of organizational hierarchy must be encouraged at all times to think of new ideas.
- *Inspire* Institutions must inspire by sharing best practices, stories about innovation and out-of-the-box thinking.
- *Creative dissatisfaction* It is the role of the teachers to foster "Creative Dissatisfaction" within the students to enable more idea generation.
- *Formal grading* Incorporation of innovation into its formal grading, making it one of the categories on which students are evaluated.
- *Game changer* It is not that that nothing is being done by government of India and other organisation like UGC, Ministry of Communication, Ministry of HRD and Knowledge Commission etc. Financial innovation like PPP model of development, governments effort in the direction of developing and encouraging industry–institute interaction promotion, improving in ICT infrastructure for HEIs by creating National Knowledge Network a huge connectivity for data transfer by GOI, through PPP models and incentives adoption of ICT in pedagogy, National Mission on Education through ICT (NME-ICT) Project (IIT-Mumbai), NPTEL provides E-learning through online web and video courses in engineering, science and humanities streams by providing free online courseware. (joint effort by IIT and IISc). All these efforts are game changer but for 1,500 university to be opened in India and innovation to be taken as key area lot more need to be done (Table 4).

Transformation of the Culture

The Indian higher education system needs a major culture change, people need to get out of their comfort zone and embrace the new innovative and creative society.

- *System* A culture of innovation won't take root if you don't have clear systems for approving and funding ideas. Till now culture have been import and copy.
- *Autonomy* Institutions and educationists must have negligible interference from the government and bureaucracy. The policy makers should let the researchers and scholar do their job while they concentrate on

National Knowledge Network Recently National Knowledge Network has been inaugurated by Mr. Sam Pitroda who is instrumental in developing frame and structure for Indian education system. Measure University has been connected via fiber network to share information/lectures/research data etc. to develop Indian education system in systematic way and also give assistance to fellow country men in developing and producing more in agriculture and other area. All these network and facilities needs to be managed in such way that it assists innovators and could be managed and share information and data. This needs first determination and then delivery mechanism to be develop at all level in educational hub. Here the role of managers of this system will become vital and will matter allot.



Table 4 Showing key challenges, government efforts and key recommendation

Game changers	Key challenges	Present efforts by the government	Key recommendations
Financial Innovation	<ul style="list-style-type: none"> • Very low per-capita spends on higher education, leading to significant paucity of funds for expansion and quality enhancement • Inadequate exploration of alternate revenue streams by HEIs • Poor coverage of scholarships and student loan schemes to support needy students and enable tuition fee rationalisation 	<ul style="list-style-type: none"> • Industry–institute interaction being Promoted: • IIT (Chennai)—TCS • IBM and National Institute of Design Collaborate on Mobile Technology Research • Three new IIITs are being set up under PPP mode (the capital cost of each IIIT would be about Rs. 128 crore contributed in the ratio of 50:35:15 by the Centre, the State Government and the industry, respectively; except for Northeast) 	<ul style="list-style-type: none"> • Encourage private sector investment in education through the development of innovative PPP models • Introduce performance-based funding by the Government • Rationalise tuition fees structures and support the same with the creation of a strong education financing mechanism • Build an enabling environment to generate alternate sources of revenue by HEIs
Innovative use of information and communication technology	<ul style="list-style-type: none"> • Lack of ICT infrastructure in HEIs and low technology/people readiness • Poor quality of digital content, especially in regional languages 	<ul style="list-style-type: none"> • NME-ICT Project (IIT Mumbai) • NPTEL provides E-learning through online web and video courses in Engineering, Science and humanities streams by providing free online courseware. (joint effort by IIT and IISc) 	<ul style="list-style-type: none"> • Improve ICT infrastructure in HEIs through PPP models and incentives adoption of ICT in pedagogy • Develop mechanisms for development and free distribution of high-quality content across languages • Improve connectivity across HEIs and create a national repository of digital content
Reinvigorating research	<ul style="list-style-type: none"> • Poor standard of research across Indian HEIs • Lack of qualified faculty, limited funding for research as well as poor linkages between academic institutions and industry/Government R&D labs 	No significant developments	<ul style="list-style-type: none"> • Incentivise research in universities, while creating an enabling environment in terms of lesser teaching hours for researchers, greater budgets and access to better infrastructure • Increase the number and quality of doctoral students through the launch of innovative programs, provision of attractive fellowships and enhanced industry collaboration

Table 4 continued

Game changers	Key challenges	Present efforts by the government	Key recommendations
Thrust on vocational education and training	<ul style="list-style-type: none"> • Low penetration of VET due to limited relevance and poor outcomes • Multiple regulatory bodies and lack of linkage of VET with the mainstream education system 	No significant developments	<ul style="list-style-type: none"> • Improve oversight structure for VET, facilitating greater industry involvement and providing greater alignment with market needs • Facilitate mobility between VET and mainstream education through a system of credit transfer • Support private sector vocational education through accreditation and recognition mechanisms
Regulatory framework	<ul style="list-style-type: none"> • Multiplicity of regulators with overlapping roles • Uneven entry barriers leading to a skewed development of the system • Limited transparency, low autonomy and poor quality control systems 	<ul style="list-style-type: none"> • NCHER Bill • The Foreign Educational Institutions (Regulation of Entry and Operations) Bill, 2010 • National Accreditation Regulatory Authority for Higher Educational Institutions Bill (NARAHEI), 2012: • Prohibition of Unfair Practices in Technical Educational Institution, Medical Educational Institutions and Universities Bill, 2010 • Higher Education and Research Bill, 2011 • Educational Tribunals Bill, 2010 (<i>Source</i> Anandakrishnan 2010) 	<ul style="list-style-type: none"> • Create a single independent agency for regulating higher education and simplify the regulatory framework • Reduce entry barriers for reputed players, by facilitating entry of high-quality foreign universities and private universities through the PPP mode • Improve transparency and disclosure in the system

Source compile by author from websites of UGC, AICTE, HRD, IITs

Conclusion

The greatest barrier to innovation in India is the lack of culture and the governance of the higher education institutions. The government and the educationists must understand that to create an innovative society it becomes imperative to educate the general people to a level that gives them autonomy and confidence to try something new and engage in research, than by further gold plating the education of the elite, which has not yet yielded any significant results and is in fact deteriorating every day. The government policies and legislations need extreme and

radical changes to encourage the innovation practices in the higher education sector. Further, the policies must be such so as to influence the culture of the students and teachers alike to be more creative and innovative in their approach. Needless to say, it is quite likely that innovative ideas will drive future growth in business and enhance an institute's competitiveness in the coming times.

Appendix

See Table 5.



Table 5 Regulatory and statutory bodies for higher education in India

S. nos.	Name, status and year, Ministry and website	Statutory mandate	Primary function	Other functions	Overlaps with functions of*
1	University Grants Commission (UGC) The UGC Act, 1956 Ministry of HRD www.ugc.ac.in	Co-ordination and determination of standards in higher education and research in the country	Release of grants to universities and colleges	Recognition of universities and college (including eligibility for central grants); specification of degrees; minimum standards of instruction; common pay scales; common facilities, and institutional accreditation through NAAC	Other professional councils and DEC
2	Distance Education Council (DEC) under Section 25 of the IGNOU Act, 1985 Ministry of HRD www.ignou.ac.in/dec/	Promotion, coordination and determination of standards of the open universities and distance education systems in the country	Release of grants to open universities and correspondence course institutes	Initiated assessment and accreditation activities	Other professional councils and the UGC
3	All India Council for Technical Education (AICTE) AICTE Act, 1987 Ministry of HRD www.aicte.emet.in	Planning and coordinated development of technical education in the country	Approval of degree and diploma programs in engineering architecture pharmacy and hotel management	Funding for institutional and faculty development; pay scales and qualifications of teachers; accreditation through NBA	UGC, DEC, Pharmacy Council of India, Council of Architecture and the State Councils for Technical Education
4	Medical Council of India (MCI) MCI Act, 1953 Ministry of Health www.mcindia.org	To establish standards in medical education and to define medical qualifications in India and abroad	Registration of medical practitioners and recognition of medical institutions	Eligibility criteria for admissions; exam for recognition of foreign qualifications for practice in India	State Medical Council and the state Governments; UGC and DEC to a limited extent
5	The Council of Architecture (COA) The Architects Act, 1972 Ministry of Urban Development www.coa-india.org	Regulate profession and practice of pharmacy in India	Registration of architects maintaining standards of education, recognised qualifications and standards of practice	Maintaining the register of architects and make recommendations with regard to recognition and derecognition of a qualification	AICTE
6	Pharmacy Council of India (PCI) The Pharmacy Act, 1948 Ministry of Health www.pci.nic.in	Regulate profession and practice of pharmacy in India	Registration of pharmacists and approval of pharmacy institutions	Prescribe curriculum and requirement of practical training	AICTE and state Pharmacy Councils
7	Indian Nursing Council (INC) INC Act, 1947 Ministry of Health www.mohfw.nic.in/incl/	Uniform standards of training for nurses	Accepts qualifications awarded by universities within and outside India	Collection and compilation of data relating to nurses, midwives, health visitors	22 State Nursing Councils with different Acts having meaning and registering powers
8	Dental Council of India (DCI) The Dentists Act, 1948 Ministry of Health www.dciindia.org	To regulate dental education and profession of dentistry in the country	Recommend to the central government to accord permission to start a dental college, starts courses and on increase of seats	Lay down course curriculum for various courses in dentistry	Ministry of Health

Table 5 continued

S. nos.	Name, status and year, Ministry and website	Statutory mandate	Primary function	Other functions	Overlaps with functions of*
9	Central Council of Homeopathy (CCH) HCC Act, 1973 Ministry of Health www.cchindia.com	Prescribe and recognize qualifications in homeopathy	Maintain Central Register of Homoeopathy	Prescribe curriculum and courses; code of ethics, requirement of recognition	State Council
10	Central Council of Indian Medicine (CCIM) IMCC Act, 1970 Ministry of Health www.ccimindia.org	Prescribe and recognise qualifications in homeopathy	Prescribes minimum standards of education in Indian Systems of Medicine viz. Ayurved, Siddha, Unani Tibb, and maintains a Central Register for the same	Prescribe curriculum and courses; standards of professional conduct, etiquette and code of ethics to be observed by the practitioners	State Councils
11	Rehabilitation Council of India (RCI) RCI Act, 1992 Ministry of Social Justice www.rehabcouncil.nic.in	Standardize and regulate the training of personnel and professionals in the field of rehabilitation and special education	Recognition of institutions for physiotherapy and related fields	Registration of professionals, assessment and accreditations; promotion of barrier free environment	–
12	National Council for Teacher Education (NCTE) NCTE Act, 1993 www.ncte-in.org	Planned and coordinated development of the teacher education in the country	Recognition of teacher education institutions	Lay down norms and standards	DEC
13	Indian Council for Agricultural Research (ICAR) not a statutory body Ministry of Agriculture www.icar.org.in	Coordinate agricultural research and education	Coordinate and fund agricultural education and research in 30 State and 1 Central and several deemed universities for agriculture	Accredit agriculture universities; hold joint admission tests	UGC
14	Bar Council of India (BCI) The Advocates Act, 1962 Ministry of Law http://barcouncilofindia.nic.in	Lay down standards of professional conduct and standards of legal education	Lay down standards of professional conduct and standards of legal education	Listing of members of bar listing of foreign universities whose qualifications are approved in India	State Bar Council
Professional Associations					
	Institute of Chartered Accountants of India (ICAI) ICAI Act, 1949 Ministry of Company Affairs www.icai.org	Regulate profession of chartered accountants in India	Conduct professional courses, coordinate practical training and hold examination	Final Exam is equivalent to masters program if a bachelors degree is obtained before	–
	Institute of Company Secretaries of India (ICSI) ICSI Act, 1980 Ministry of Company Affairs www.icsi.org	Regulate profession of company secretaries in India	Conduct professional courses, coordinate practical training and hold examination	Final Exam is equivalent to masters program if a bachelors degree is obtained before	–

Table 5 continued

S. nos.	Name, status and year, Ministry and website	Statutory mandate	Primary function	Other functions	Overlaps with functions of*
	Institute of Costs and Works Accountants of India (ICWAI) ICWAI Act, 1994 Ministry of Company Affairs www.icwai.org	Regulate and develop profession of cost accountants in India	Conduct professional courses, coordinate practical training and hold examination	Final Exam is equivalent to masters program if a bachelors degree is obtained before	-
	Association of Indian Universities (AIUs) set up in 1925 as a membership-based organisation—a registered society www.aluweb.org	Promote inter-university activities and cooperation in the field of education, culture, sports and allied areas	Public university health news and handbook of Indian universities and various other publications	Organize academic sports and cultural events, equivalence of Degree/Certificates awarded by the accredited foreign universities/ educational institutions	UGC

In addition, there is a National Council of Rural Institutes (NCRIs) set up in 1995 as a nodal organisation for development of rural institutions in the country This has been a non starter

In most cases, there is some overlap in functions of professional council and academic functions of the university concerned
Source Compiled by the author with information from the respective website and also interaction with officials of various bodies

References

- CII Karnataka (2008).
- Daft, R., & Lewin, A. (1993). Where are the theories for the new organizational forms? An editorial essay. *Organization Science*.
- Drucker, P. (1986). *Innovation and Entrepreneurship*.
- Garia, N. What they said: Jairam Ramesh slams IITs and IIMs. *Wall Street Journal, India Edition*.
- Ghura, P. (2011). <http://studyplaces.com/articles/411443-not-even-a-single-iit-feature-in-top-500-universities-of-the-world>.
- Inconvenient truth. *Economic Times* 26 May 2011.
- Krishnamurthy, V. K. (2011). Director and Executive Vice-President Alliance Business Academy.
- Lawrence, P., & Dyer, P. (1983). *Renewing American industry*. New York: Free Press.
- Naik, C. (1974). *Educational innovation in India*. Paris: UNESCO Press.
- Ouchi, W. (1981). *Theory Z*. Reading, MA: Addison-Wesley.
- Pascal, R., & Athos, A. (1981). *The art of Japanese management*. New York: Warner Books.
- Peters, T., & Waterman, R. (1982). *In search of excellence: Lessons from America's best-run companies*. New York: Harper and Row.
- Rogers, E. M. (1982). *Diffusion of innovations*.
- Schmittlein, D., & Mahajan, V. (1982). Maximum likelihood estimation for an innovation diffusion model of new product acceptance. *Marketing Science*, 1, 57–78.
- Schumpeter, J. (1942). *Capitalism, socialism, and democracy*. New York: Harper and Row.
- Sen, A. K. (1970). *Collective choice and social welfare*. San Francisco: Holden-Day.
- Vora, N., & Dewan, S. (2009). Indian education sector: Long way from graduation. Sector Report. Mumbai: IDFC-SSSKI India Research. The Times of India in its editorial headlined "Aim for World Class". <http://indiatechonline.com/it-happened-in-india.php?id=182>. http://web.mit.edu/tlo/www/about/office_statistics.html.
- Zaltman, G., Duncan, R., & Holbek, J. (1973). *Innovations and organizations*. New York: Wiley.

Key Questions

- (1) What Strategy is integral part of innovation? And what motivates innovators?
- (2) What should be the role of policy makers and Managers of institutions to support innovative environment?
- (3) How to strategize all aspects to achieve the innovative environment?

Author Biographies



Umesh Chandra Prasad completed his BTech from BIT, Ranchi University and was commissioned as an Air Force Officer, where he served the nation for 29 years in various capacities, being an Aeronautical Engineer (Electronics). During his tenure, he completed MTech (joined in 1992) Degree from IIT Delhi in Systems. He also worked as an Instructor with Air Force Technical Collage and other Institutes of IAF. Further, he did Executive Management

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Pratiksha Prasad has completed her BSc from Delhi University and is a Commercial Pilot License holder, presently working as a Pilot Instructor with Banasthali Vidyapith Gliding and Flying Club. She is also a student of Executive MBA (Aviation Management) from University of Petroleum and Energy Studies, Dehradun, India.