Technical Education in India
A FUTURISTIC SCENARIO

Report of the AICTE Review Committee, 2015

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Ministry of Human Resource Development
Government of India
APRIL 2015

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OVERVIEW

Appendices

Part I: IN THE BEGINNING

If we find the answer to why the universe exists, it would be the ultimate triumph of the human reason. For then we would know the mind of God

– Stephen W. Hawking

Chapter 1

Preface

Birds born in a cage think flying is an illness
Alejandro Jodorowsky

1.1 In 1947, India liberated Durga, the Goddess of political dominion from the shackles of the British Raj. In 1991, we liberated Lakshmi, the Goddess of Wealth from the fetters of the Licence-Permit Raj. Now in 2015, it is the turn of Saraswati, the Goddess of Learning to be freed from the yoke of Regulation by multiple agencies like UGC/AICTE et al.

1.2 Each phase of unfetterment has been an affirmation of the basic capability of a whole class, be it the political leadership or the private entrepreneurs, to manage the affairs of a resurgent nation. It has been a vote for autonomy.

1.3 India has the potential of once again becoming the Jagadguru of the world, if we liberate our educational system from the tyranny of controls. This is the central message of our Report.

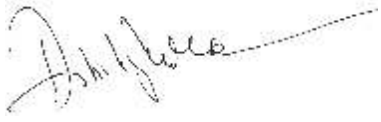
1.4 If we look at the historical evolution of the higher education system in the advanced countries of the world, we find that Governments have distinguished between their responsibility for providing sufficient funds from the public exchequer and their total unwillingness to interfere in the day-to-day functioning of such institutions. For example, Oxford and Cambridge are great universities because while the British Government has provided munificent grants to them, they have not dreamt of intervening in their processes of governance.

1.5 If the same British Government legislated a different framework for the Universities they established in India, it was with a purpose.They were implementing Macaulay's infamous Minute on Education. They did not wish to create a mechanism for nurturing and fostering a generation of independent thinkers and emancipated freedom fighters. We are the unfortunate heirs to that colonial legacy.

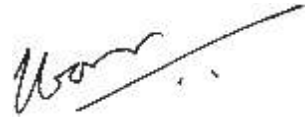
1.6 Today there are only four countries of the world where colleges are affiliated to universities. These are India, Pakistan, Bangladesh and Srilanka, all remnants of the British Empire.

1.7 Let us unshackle ourselves from the remaining manacles of our bondage!

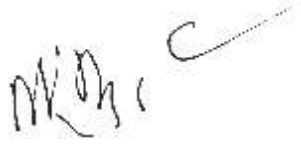
(M.K.Kaw)
former Secretary, MHRD, Government of India
Chairman



(Prof. Ashok Jhunjhunwala)
I.I.T Chennai
Member



(Prof. U. B. Desai)
Director, I.I.T Hyderabad
Member



(Prof. A.K.Aggarwal)
Vice Chancellor, Gujarat Technological University, Ahmedabad
Member

22 April, 2015

With assistance from: Prof. Nawal Kishore Ambasht, former Chairman, National Institute of Open Schooling - "Rapporteur"

Chapter 2

The beginning

Only at the precipice we change
Klaatu(The Day The Earth Stood Still-2008 film)

2.1 It all started with an order issued by the Ministry of Human Resource Development, Government of India (copy at Annexure). The order desired that a group consisting of a former Secretary(HRD), a Director of an IIT, a Professor of another IIT and a Vice-Chancellor of a technological university should review the working of the All India Council of Technical Education. Very elaborate terms of reference were set out and a time-limit of six months from the date of issue of the order was prescribed.

2.2 The Committee lost no time in going about its business. An advertisement was issued in the national dailies and a notice put out on the Facebook calling for memoranda from stakeholders. The response was enthusiastic and we were encouraged to find so many eminent people willing to spend time either on personally appearing before us or sending detailed memoranda elaborating their views and suggestions. Lists of persons and institutions who responded are placed at Appendices F and G. As will be seen from the lists, we have been able to obtain the views and sugestions from a vast cross-secion of people, ranging from ordinary men and women in the street to very distinguished persons who have held high positions in education, research, industry and the government. We have succeeded in eliciting the views of all the stakehoders. Detailed particulars of the meetings held by the Committee are placed at Appendix F.

2.3 We are grateful to Shri Satyanarayan Mohanty, Secretary(HE), Shri Amarjeet Sinha, former Additional Secretary(TE) and Shri Raju Srinivasan, Director in the MHRD for their help and support. A lot of useful material was made available to us by many officers of the AICTE under the leadership of Dr. S.S.Mantha, former Chairman and Dr. Avinash Pant, acting chairman, AICTE. Our task was rendered easier due to the contribution made by Prof. N.K. Ambasht, former Chairman, National Institute of Open Schooling who acted as the Rapporteur to the committee. We owe special thanks to Shri Bharat Ram, Chief Administrative Officer, AICTE for his continuous logistic support. We are particularly thankful to Dr Deepak Mathews, Associates Prof. at IIT Hyderabad for designing the cover, Dr Leena Chandran Wadia of OAF, Ms. Uma Rajesh of IIT Madras for helping in writing some chapters. We are also thankful to Smt. Sunita of AICTE for heping with the preparation of the Organogram and Shri Nishant Jain for help in preparing the tables and diagrams.

Annexure to Chapter 2 : Order constituting the Committee

F.No. 1-19/2014-TS-II
Government of India
Ministry of Human Resource Development
Department of Higher Education
Technical Section-II
*****

New Delhi, dated 22nd October, 2014.

ORDER

Subject: Constitution of All India Council for Technical Education Review Committee to restructure & strengthen the Technical Education Sector.

Indian Technical Education sector has witnessed vast growth in terms of expansion as well as quality. The number of technical institutions in the country has increased manifolds since last two decades. Such expansion and massification has thrown up a wide variety of challenges and addressing these challenges by maintaining quality and adoption of world class norms would constitute the key to ensure advances in the Human Development Index of the Country and transform the country into a knowledge society.

2. The All India Council for Technical Education (AICTE) was set up in 1987 by an

Act of Parliament {i.e. The All India Council for Technical Education (AICTE) Act, 1987}. The definition of technical education under the AICTE Act, 1987 is "programmes of education, research and training in engineering, technology, architecture, town planning, management, pharmacy and applied arts and crafts and such other programmes or areas as the Central Government, may in consultation with the Council, by notification in the Official gazette, declare."

3. However, there is a realization that the AICTE is finding it difficult to match the demand of private players in the field of technical education. It is a fact that lot of private institutions have come up in technical education sector and there is a growing trend of commercialization of technical education and the laid down norms and standards of technical education are not fully implemented. The technical education sector needs to be reoriented in light of these difficulties and globalization and competition in economy and the technical education needs to be redefined. Therefore, it is imperative that an urgent review of the AICTE be conducted.

4. The Central Government, therefore, recognizing the need for restructuring and strengthening the All India Council for Technical Education to address imperatives and challenges in the Technical Education Sector for fullest realization of the higher/technical learning and research potential in the Country, hereby constitutes a AICTE Review Committee with the following members:

   (i) Mr. M.K. Kaw (Ex-Secretary, MHRD)…….....Chairman

   (ii) Prof. Dr. A.K. Aggarwal (VC, Gujarat Technological University……Member

   (iii) Prof. U.B. Desai, (Director, IIT Hyderabad)…….....…Member

   (iv) Prof. Ashok Jhunjhunwala (IIT, Chennai)…….....Member

5. The Committee shall conduct a review of the present status of AICTE and suggest restructuring and re-organizing of AICTE for attaining even better performance to meet the desired objectives. The Committee shall also suggest amendments to the AICTE Act, 1987, and the Rules and Regulations made thereunder. The following shall be the items of review / Terms of Reference (TOR) of the Committee:

   (i) Evaluation of the performance of the AICTE in coordinating and determining standards of education in technical institutions, conducting an audit of its regulatory reach and identifying strengths and weaknesses on this aspect. (This will also include an evaluation of the performance of the Regional Offices of the AICTE).

   (ii) Requirement of regulatory space for the AICTE vis-à-vis other regulatory bodies for providing educational leadership in the technical education sector.

   (iii) Analysis of the regulatory function vis-a-vis grant disbursing function of the AICTE and recommending changes in the balance between the twin functions.

   (iv) To suggest way and means to set up a robust accreditation system in the technical education sector to meet the challenges of mandatory accreditation.

   (v) Use of Information and Communication Technology alongwith Business Analytics.

   (vi) Revamping the grant disbursing function of the AICTE to introduce effectiveness and efficiency for timely utilization of grants.

   (vii) Analyze the way AICTE staff is organized in head office and regional offices and suggest re-structuring of the entire AICTE including its regional offices.

(viii) Measures for enhancing quality research in technical education and ushering a climate of innovation in technical education sector in the country.

(ix) Measures for effectively regulating distance education and online education in the country and to harness the technology for enabling access to technical educational institutions.

(x) New measures for enhancing student mobility and internationalization/ globalization of the technical education sector.

(xi) Suggest amendments in the AICTE Act, 1987 to meet the present day requirements

(xii) Suggest measures for industry persons (from Government, PSUs and Pvt.) to be appointed as faculty on deputation and possible amendments in Regulations of AICTE.

(xiii) Suggest measures for streamlining the vocationalization of technical education.

(xiv) Regulation of Private Not-for-Profit entities in technical education and also measures to curb commercialization.

(xv) Suggest measures to issue equivalency in all levels of degrees and NSQF

(xvi) Any other item as deemed fit by the Committee.

6. The Committee shall submit its report within a period of six months from the date of issue of order for constituting the Committee. The Committee shall cease to function on the day it submits its report to the Government. The AICTE shall provide all secretarial assistance and logistics support to the Chairman and Members of the Committee. This will include expenditure on travel and accommodation of the Committee on its visits for conducting interaction with technical educational institutions and academics.

7. The Committee may devise its own methodology and processes for its functioning. The Committee may also engage Experts, rapporteurs and raconteurs as required by it for enabling smooth progress in its working. The expenditure for engagement of such Experts, rapporteurs and raconteurs may also be borne by the AICTE.

Sd/-
(Amarjeet Sinha)
Additional Secretary to the Government of India

To:

The Chairman and all Members of the Committee.

Copy to:

1. The Chairman, AICTE.
2. PS to Hon'ble HRM
3. PS to Secretary, Department of Higher Education, MHRD.
4. PS to Secretary, Department of School Education, MHRD.
5. PS to Secretary, Planning Commission, Yojna Bhavan, New Delhi.
6. PS to Additional Secretary (TE), MHRD.
7. All Joint Secretaries in the Department of Higher Education, MHRD.
8. Heads of all Centrally Funded Technical Institutions and Central Universities.
9. Webmaster, MHRD-for uploading the Order on the website of the MHRD for general information.

Sd/-
(Amarjeet Sinha)
Additional Secretary to the Government of India

Chapter 3

Basic thrust of the report

Live as if you were to die tomorrow, learn as if you were to live for ever
Mahatma Gandhi

3.1 **Infirmities in educational system:**

The fundamental infirmities in the educational system of this country have been a lack of direction, an absence of trust, extremes of anarchy and over-regulation, multiplicity of agencies and vagueness in the drafting of legislation. The field of technical education has also been a victim of these weaknesses.

3.2 **A malady- remedy analysis of the sector reveals the following flaws in its functioning:**

3.2.1 **A lack of direction:** The strategies followed in the past do not reveal a consistent policy direction. Institutions and organisations have come up in a haphazard manner. When, on the recommendation of the Central Advisory Board of Education, the AICTE was constituted in 1945 as an advisory body, it was meant to be the apex of the technical education pyramid. Around the same time, the Sarkar committee recommended the establishment of higher technical education institutions on the pattern of M.I.T. in USA and accordingly four IITs were set up. Even when the AICTE was converted into a statutory body in 1987, it was supposed to ensure the proper planning and coordinated development of the technical education system at all levels throughout the country. Over the years, various institutions have come up either in the public or private sector, with varying degrees of autonomy from the control of this apex body.

3.2.2 Some of the organisations like the IITs were set up by the Government and given full autonomy from the very inception. Some like the IIMs decided not to align themselves with the AICTE due to the rigorous controls and a perception that their own brand image was much superior to what the stamp of AICTE approval would confer on them. A few like the Indian School of Business chose not to get into the AICTE fold and in the process built a worldwide reputation.

3.2.3 Over the years, the field has been littered with thousands of institutions affiliated to universities, deemed universities, private universities, technical universities and so on. Due to the absence of an overall policy perspective, all of these move in different directions, thus adding to the general confusion.

3.3 **The absence of trust:** The entire system of educational administration is based on the colonial mindset of mistrust. India is one of the only four countries in the world, where colleges are affiliated to universities. The other three are Pakistan, Bangladesh and Sri Lanka. Thus affiliation, far from being a universal phenomenon, is confined to the remnants of the erstwhile British Empire in India and Ceylon.

3.3.1 The mistrust surfaces in a variety of ways. Government of affiliating universities would like to prescribe the curricula and the syllabi, not permitting deviation from the prescribed norms even though this may lead to absurd results. Experimentation in course content, pedagogy, teaching style etc. is virtually barred. The regulator lays down norms on everything: size of classroom, student-book ratio, student-computer ratio, size of playfields, size of boardroom etc.

3.4 **Extremes of anarchy and over-regulation:** The AICTE seems to move in phases. Sometimes, it is accused of too strict a methodology for measurement of suitability of a greenfield institution and in its anxiety to prove its credentials, it becomes over-liberal. When there is a spate of approvals, then it is accused of ushering in an age of anarchy.

3.5 **Multiplicity of agencies:** The Government of India is constituted in a certain way. Administrative Ministries jealously guard their turfs and they would not brook a subject allotted to them by the Business Allocation Rules to be pilfered away from them. Turf wars In New Delhi are pitched battles.

3.5.1 Naturally a proposal of the Working Group on Management Education constituted by the National Knowledge Commission that there should be an overarching coordinative forum called the ERAHE (Exclusive Regulatory Authority for Higher Education) did not receive much attention. So was the Yash Pal Committee's proposal to merge all the councils into a National Commission for Higher Education & Research consigned to limbo.

3.5.2 The moral of the story is that we are stuck with a multiplicity of regulatory agencies and the challenge is to make them function in unison with one another.

3.6 **Vagueness in drafting of legislation:** Multiplicity of agencies need not have been a fatal defect, had the legislation been drafted carefully, delineating clearly the exact areas of jurisdiction of the various agencies.

3.7 **Grey areas of jurisdiction :** While the UGC thinks that it is the highest body in the field of higher education, the AICTE has interpreted the law differently to give itself the authority to approve or disapprove technical education institutions. The subject matter Councils like the Pharmacy Council, the Council of Architecture etc. think they should have the last word on the institutions allotted to them.

3.7.1 What is lacking is clarity of thinking on who is supposed to do what. One of the many suggestions for bringing order in this dismal scene is rather simple. It has been proposed that the UGC should look after issues relating to affiliation as long as we continue to harbour this antediluvian system, the AICTE act as the mentor, developer and regulator, and the subject councils confine themselves to matters relating to practice of specialised professions.

3.7.2 There are some who blame the courts for interfering in jurisdictional issues. They do not appreciate the basic fact that clarity of language and intent has to be provided by the legal draftsmen of the Government The courts merely interpret what they find on the statute book. So what is required is clarity of thinking in the MHRD, followed by clear-cut provisions of law.

3.8 **Overall approach of the Committee:**

The Committee was given a difficult mandate: read up everything that has been said about the AICTE by previous committees, comments by experts in newspaper and magazine articles, oral evidence offered by numerous stakeholders both formally and informally, churn the disparate material in the inferno of our own minds and come up with an agenda for action, all within a space of six months.

3.8.1 **We had three options:** accept the rosy picture presented by the top brass of the Council about the revolution they had wrought in the previous five years, or pay attention to the extremely dark scenario painted by their critics, or suspend our judgement and try to steer a balanced middle path between the two extremes. We chose the third option.

3.8.2 **The positive side:** We can truly accept the positive side of the story which talks of the e-governance approach that has led to online submission of applications, a

minimum interface with the human element, transparency and related positive aspects of that metamorphosis. We can also greet with approval the physical infrastructure that has come up in the shape of the Building complex at JNU Campus, New Delhi. It is certainly creditable that India has been able to gate-crash into the select fraternity of the Washington Accord. Accreditation has been liberated from the clutches of the regulator through the creation of NBA as a separate entity not under the administrative control of the AICTE. There has been a massive increase in the number of private colleges both in engineering and management. These have come up in unserved or underserved regions, or are catering to the not-so-bright students.

3.8.3 **The negative side:** At the same time, everyone accepts the fact that the AICTE has created a dismal situation by over licensing of new institutions run by wannabe operators wishing to park their black money in the real estate of educational complexes with the patent objective of making a fast buck. One realizes the blunder committed through the mistaken burial of the National Technical Manpower Information System (NTMIS), which was undoubtedly an imperfect instrument of manpower planning, but ought to have been replaced by a superior mechanism thus avoiding the vacuum that has been created. It is clear that the Council has not outgrown the mind-set of the licence-quota raj and still considers itself to be a policeman. It has to move away from the input-based mode of regulation to the outcome based strategy which has been adopted by the rest of the world. It has been unable to resolve the impasse created by the turf battles waged by competing regulators. It has not promoted to the desired extent the use of information technology in teaching learning processes, both in the formal stream and the distance education mode. It has yet to build bridges with industry so as to match the supply with the emerging requirements of the employment market. Above all, it has to place its own house in order by building a professional cadre of technocrats who can effectively galvanize the entry of India into the global scene.

3.8.4 **The middle path:** So what about the middle path? We have tried deliberately to avoid the extremes. We have not accepted the hypothesis that that there should be a single regulator, or a single accrediting agency or a plethora of examinations. In operational terms we have moved away from the proposition that there should be a single omnipotent agency, be it the ERAHE, the UGC or the NCHE.

3.8.5 We have accepted the general suggestion that the universities should have an affiliating role in the interim period for which we continue with this outmoded system, the AICTE assume a predominantly mentoring-cum-development role while

continuing with an attenuated role in the regulatory mode and the Subject matter Councils be satisfied with a predominant role in professional practice. We would like the NBA to gradually flower into an umbrella organisation supervising the various accrediting agencies, be they in the public, private, PPP mode or any other avatar.

3.8.6 **rating as the fulcrum of regulation:** We would make rating by third party rating agencies as the fulcrum of the regulatory system. The AICTE should have a National rating Agency as an autonomous body which would empanel the third party rating agencies.

3.8.7 We would also advocate the setting up of a National Testing Agency conducting the limited admission tests that would replace the plethora of tests currently in vogue. We would welcome the setting up of a National Centre for Futuristic Education that would anticipate emerging technologies, be the think tank for new courses of study, and experiment with pilot projects of different models of computer-aided or blended learning.

3.8.8 **AICTE's role as a regulator:** In our view, AICTE's role as a regulator needs to be redefined. It should examine the credentials of the promoters and guess at their motivation in entering the field of technical education. If the promoter is a family concern which looks upon the educational institution as a mere profitmaking venture, it needs to be discouraged. If it seeks to add capacity in a discipline which is already oversubscribed in relation to the demand, it should not be allowed to come up. If the inputs are only marginally adequate and often slip into inadequacy, it should be served a warning. If it allows the situation to worsen in terms of falling admissions, vacant seats, deficient campus recruitment and other visible and measurable signs of decay, it should be warned that it might be merged in an existing well-run institution or deregistered if it does not improve. In the worst case scenario, a particular specialization or some sections thereof might face the axe. In extreme cases where there are scanty chances of improvement, the institution might be closed and the promoters blacklisted.

3.8.9 This regulatory role should be performed by the AICTE on the basis of assessments made from year to year by third party rating agencies. Such agencies should be empanelled by the AICTE. All decisions taken by the AICTE should be based on the rating of the applicant institution. The suggested procedure has been outlined in a separate chapter. Suffice it to say that rating by third party agencies will be at the centre of the new system being advocated by the Committee.

3.9 **AICTE's role as mentor:** The Report also seeks to establish the AICTE in the role envisaged for it under the Act. What AICTE should assume is the positive role of a mentor. Where it finds an institution in trouble and the motivation of the promoters inspires confidence, it will study the various elements leading to viability and send teams of experts to advise the management on how to revitalize the institution. As an institution improves its functioning and performance, it will be rewarded by a calibrated grant of autonomy in formulation of the curriculum, devising of experiments in educational processes, holding of examinations, award of degrees, determination of the scale of fees and so on.

3.10 But for all this to happen, the AICTE would have to be a very different body from what it has been in the past. It will have to take a new incarnation as an autonomous body insulated from outside pressures, led by persons of repute and of impeccable integrity. We have tried to indicate the broad contours of that metamorphosis in subsequent chapters.

Chapter 4

Executive summary

I don't want to bother with the truckload of roses because
I would rather walk away with the drop of rose oil.
C. JoyBell C.

4.1 **AICTE a Constitutional autonomous apex authority:**

AICTE should be recognised as the chief instrument of State policy in order to establish India as the Technical Education Superpower of the world. It should be converted into a Constitutional apex authority having the statutory power to promote the orderly, integrated and coordinated development of technical education at all levels in India. It should be fully autonomous. Technical education should be a fundamental right.

4.2 **To concentrate on mentoring and development:**

Currently AICTE functions with the mind-set of the licence-permit raj and sees itself as the policeman. It has to get converted into a facilitating agency which promotes technical education of global standards through suitable schemes of mentoring and guidance, faculty improvement, development of research and incubation infrastructure, grant of financial assistance to deserving institutions and individuals and so on.

4.3 **To focus attention on research and innovation:**

It should focus attention on research, innovation, business start-ups, patenting, faculty improvement and induction of IT-enabled learning. New institutions should be allowed only if there is substantial unmet demand pertaining to an area or a specialisation.

4.4 **rating to be the fulcrum of regulation:**

Third party rating should be used as the fulcrum of regulation. Norms shall measure outcomes rather than be obsessed with physical inputs alone. There shall be a level playing field with reference to the non-governmental self-financing institutions. Values should be inculcated both by example and precept.

4.5 **To improve sub-standard institutions:**

The apex body shall improve the functioning of the sub-standard institutions started by promoters with commercial motives, with the help of senior faculty drawn from higher technical institutions who will act as mentors and trainers, developers and facilitators.

4.6 **Provision for internship:**

There shall be provision for a specified period of at least two months when the undergraduate students shall act as interns and receive practical on-the-job training with industry. Twinning arrangements shall be entered into so as to benefit students with the best practices worldwide.

4.7 **Robust accreditation:**

The National Board of Accreditation shall be the umbrella authority charged with the power to recognise accreditation agencies in the Government, private and PPP modes.

4.8 **National testing service:**

There shall be a single National Testing Service which shall conduct a Joint Entrance Examination for engineering courses and a Common Admission Test for management courses, the results whereof shall be used by all institutions whether run by universities, deemed universities, State Government-run universities, private universities etc. The seats which fall vacant after the completion of counselling sessions shall not be treated as a management quota, but shall be used to accommodate students on the waiting lists of these examinations. Exit tests like GATE shall also be made universal

4.9 **Permanent staff:**

The apex body shall have sufficient staff, all of whom shall be on its permanent establishment except for some Principal Advisers and Advisers. Sufficient prospects for promotion shall be ensured, while simultaneously inducting fresh blood. Experienced persons from industry shall be taken on deputation so as to provide an element of industry perspective in the Council.

4.10 **Charting the territories:**

Affiliation should be phased out within a decade and should remain with the universities as long as it continues. The AICTE should regulate, mentor and develop deserving institutions and the Subject-matter Councils should oversee the professional practice.

4.11 **Distance and life-long education:**

Distance and life-long education should be promoted with the help of information technology, MOOCs and other such emerging blended learning practices. These should be interspersed with practice and personal contact programmes.

4.12 **Vocational education:**

Technical and vocational education should be dovetailed into one another by a liberal regime of transfer of credits between countries, states and institutions.

4.13 **Quantum jump in allocation of funds:**

The MHRD should enhance the block plan allocation of funds to the apex body to Rs. 5,000 crores to begin with, and there should be an escalation factor of 10% every year. The allocation should be non-divertible and non-lapsable.

4.14 **India a technical education superpower:**

The goal should be to establish India as a technical education super-power within the next decade. The manpower produced at various levels should not only fire the engines of rapid development within the country but should enable India to be a bulk supplier of highly rated manpower to the rest of the world.

Chapter 5

Manpower planning

It is far better to foresee even without certainty than not to foresee at all
Henri Poincare

5.1 One of the problems in the field of technical education has been the absence of a satisfactory system of manpower planning. When we tried to probe into the reasons for a proliferation of institutions despite the lack of demand, several inadequacies came to light.

For instance, when there was a psychological mind-set that information technology was the in thing, Government at one stage decided to quadruple the capacity of existing institutions in respect of IT courses. Similarly there has been overproduction of biotechnology personnel on the basis of a general feeling that this was a field likely to require a quantum jump in supply to match the expected spurt in demand.

5.2 The AICTE had been patronising the National Institute of Applied Manpower Research (IAMR) under the NTMIS (National Technical Manpower Information System) scheme. We were informed that the IAMR had an arrangement under which it collected data from all over the country and collated it before passing it on to the AICTE. A lump-sum bill was raised on the AICTE, which was paid every year under the arrangement then in force.

5.3 In 2010, when the AICTE decided to go for e-governance in a big way, it also reviewed its arrangement with the IAMR. It came to the conclusion that the information received from the IAMR was not up-to-date and the processing took so much time that there was considerable time lag even up to two years before the data was made available to the AICTE. It also discovered that the IAMR had not deployed any staff on a fulltime basis to collect and supply the data. Some of their staff working on other projects was deployed on a part-time bass on the NTMIS work.

5.4 Accordingly, the arrangement with the IAMR was terminated and no alternative has so far been devised. The matter was discussed with various stakeholders. The following points emerged as a result:

i) Planning was now not a primary issue on the Government's agenda. The Planning Commission had been abolished and replaced by a Niti Aayog. If manpower planning was now revived as a basis for the decision making of regulatory bodies, it would be considered as a retrograde step under the present circumstances.

ii) With the implementation of e–governance within the AICTE the supply side data was, at least in theory, carried on the website of the Council. It was another matter that despite a statutory obligation, many of the institutions were not supplying data by the scheduled date every year. The result was that even the supply side data was incomplete and stale.

iii) As far as the demand side was considered, AICTE had been requesting the State Governments to assemble and supply the demand data, but to no avail. The technical education departments of the States did not have staff and resources so as to assemble, analyse and collate the data. One possibility was to continue to persuade the State Governments to pursue this.

iv) Some of the industry associations like the FICCI, Assocham, CII , Nasscom etc. had been farming out such studies to specialised agencies and publicising the results of such studies. Their reports commented on the employability of the products of technical institutions. Others referred to the vacant seats in certain disciplines or the fact that there was unemployment in certain cadres and specialisations.

v) One emerging source was the individual industry associations which studied the employment market in respect of disciplines relevant to them. These studies were closer to the ground and threw up useful data.

vi) Certain countries had started the practice of bringing out Government reports containing information on emerging technologies, situation of demand and supply in different disciplines and areas, scale of investment likely to take place over the foreseeable future from the public exchequer and in the private sector in the relevant fields. Various stakeholders were now basing their decision making on the information contained in such reports. This could possibly be one of the ways manpower planning would take place in the coming decades.

5.5 In conclusion, it may be said that while information was used as a weapon by the regulatory agencies in the heydays of the licence-permit raj, it would now be made available in a transparent manner to all stakeholders. Henceforth, information would be used as the rational basis for decision-making by individuals like parents, students,

industrial and commercial enterprises, rating and accreditation agencies, mentoring bodies and the like.

5.6 In this limited context and purely to keep all the relevant information available to all stakeholders on a real-time basis, the AICTE may assume the responsibility for publishing an annual report on demand and supply of technical manpower. This task may be assigned to the division dealing with planning, survey and statistics.

In case it was considered to be too specialized and time consuming a task, the work could be assigned to an agency on a five year contract, after calling for tenders from qualified bidders.

Part II- AICTE PAST AND FUTURE

The best way to predict the future is to create it

– Peter Drucker

Chapter 6

Historical evolution of AICTE

It does not matter how slowly you go as long as you do not stop
-Confucius

6.1 **AICTE set up:** In 1945 soon after the Second World War, the Reconstruction Committee of the Viceroy's Executive Council asked the Central Advisory Board of Education to give its suggestions about the post-war educational system in India. One of the important recommendations of CABE was the constitution of an All India Council for Technical Education as the apex body for the rapid development of technical education in the country.

6.2 Accordingly, the Government of India passed a resolution dated 30th November, 1945 setting up the AICTE as the national agency for the planned and coordinated growth of technical education in India. It had Regional Committees with offices at Chennai, Mumbai, Kanpur and Calcutta. Although it had no statutory powers, it played an important role in the development of technical education in the country. All the new schemes and proposals to start new institutions were approved by the corresponding Regional Committee and subsequently vetted by the Council.

6.3 As a consequence, there was rapid expansion of technical education in the late fifties and early sixties and again in the eighties. Although the expansion in the fifties and sixties was achieved with the blessings of the AICTE and approval of the Government of India, the expansion in the eighties was mainly localised in the four States of Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu and was primarily in the self-financing sector without the approval of the AICTE and the Government of India.

6.4 **AICTE Act passed, 1987:** The National Policy on Education, 1986 stated that the AICTE would be vested with statutory powers in order to ensure the coordinated and integrated development of technical and management education .The AICTE Act was passed in 1987 with a view to proper planning and coordinated development of the technical education system throughout the country.

6.5 Under the AICTE Act 1987, the Council was tasked with the duty of coordinating the development of technical education at all levels, allocating grants to technical institutions and universities, evolving performance appraisal systems for technical

institutions and universities, incorporating norms and mechanisms for enforcing accountability and other matters connected therewith.

6.6 **IITs set up:** There have been other developments. In 1945 the Government set up an adhoc committee under the chairmanship of Shri N.R.Sarkar to advise on the provision of advanced technical education on the pattern of the MIT in USA. Consequently, five Indian Institutes of Technology were set up at Kharagpur, Bombay, Kanpur, Madras and Delhi in the next decade.

6.7 RECs set up: In 1955, the Planning Commission set up an Engineering Personnel Committee to undertake an overall assessment of the demand and supply position in respect of engineering personnel. As a consequence, seventeen Regional Engineering Colleges were set up by 1989.

6.8 **RTTIs setup:** On the recommendations of the AICTE, the Government established four Regional Teachers' Training Institutes at Bhopal, Calcutta, Chandigarh and Madras in 1967 to meet the requirements of developing polytechnic education in their respective regions.

6.9 **Apprentices Act passed, 1961:** An Apprentices Act was passed in 1961 to regulate and control the training of apprentices in trades. In 1967 the Act was amended to bring the training of engineering graduates and diploma-holders within its purview.

6.10 **Management education emerges:** Management education emerged as a separate discipline In the US at the University of Pennsylvania in 1881 and in Europe it started only in the late 1950s. India took the lead in this field. In 1957 the All India Management Association was created as an apex body with the active support of the Government of India. The IIM Calcutta was established in 1961, IIM Ahmedabad in 1962, IIM Bangalore in 1973, IIM Lucknow in 1984, IIM at Calicut in 1997 and IIM Indore in 1998.

6.11 **Phenomenal growth:** There has been a phenomenal growth of technical institutions during the last two decades. The figures of number of institutions and intake at undergraduate and post-graduate levels in the different branches of technical education between the years 2006-07 and 2014-15 have been summarised in the tables in the following pages.

6.12 To take the engineering courses, it will be seen that the number of institutions rose from 1511 in 2006-07 to 3389 in 2014-15. The intake rose from 6.59 lakh to 16.93 lakh. The intake in post-graduate courses in management grew over the same period from 2.47 lakh to 4.55 lakh.

6.13 **E-governance:** Before 2010, all the approval processes were manually completed without robust processes being defined. This caused the system to be misused by people as per their interpretation which sometimes led to unfair practices. The nadir was reached when the Council's functioning came under the CBI scanner. Several criminal cases were filed by the CBI and a top functionary arrested and later dismissed by the Government. This brought the Council in disrepute.

6.14 A major initiative of the last five years is the introduction of e-governance in the working of the Council. It now covers all approval processes, work flow and accounts, security systems, legal cases, disbursal of funds in schemes of grants. The entire database of institutions and their detailed information is now available in the public domain. The processes were well defined. This led to the credibility of the system, with inbuilt accountability and transparency.

6.15 The process of e-governance went through several discussions among the officers of the Council, the stakeholders and the people. The processes were refined each year and the same underwent improvement from time to time. Every year new parameters are getting added, making the system more comprehensive and logical.

6.16 The introduction of the e-governance system has led to faster processing of the applications. What used to take about one year is now completed in three to four months. The Council has a complete database, from which data can be generated very quickly.

6.17 Most stakeholders have welcomed the e-governance initiative. The level of corruption is claimed to have gone down due to minimization of interface between the officials of the Council and the promoters of institutions. Two points of criticism still remain. Some stakeholders have stated that there is too much of impersonality in the functioning of the Council. When a stakeholder has a grievance, he can only complain to the system which is mechanical in its response. What the people miss is the human interface.

6.18 The other complaint is that the website which is supposed to contain the complete details of faculty, infrastructure etc. is not up-to-date because many of the promoters fail to post the latest data every year. The Council is unable to withhold the annual renewal of approval because it impinges on the career of students.

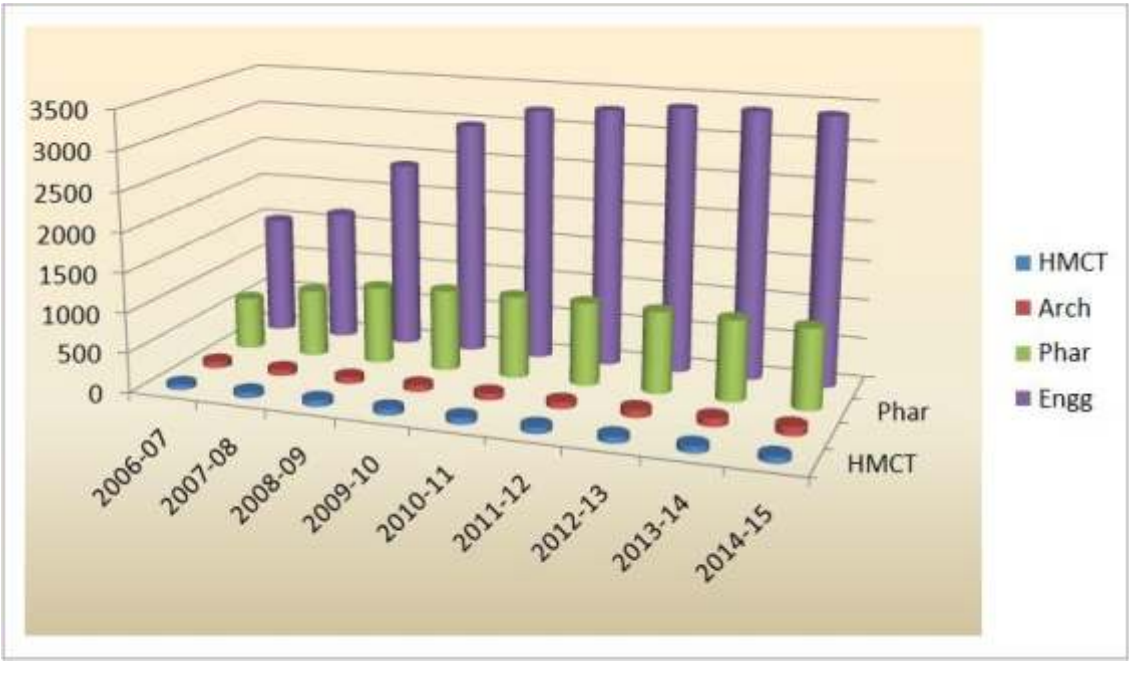
6.19 **Massive headquarters constructed:** Another positive feature of recent history is the construction of the massive headquarters office of the Council in the campus of the Jawaharlal Nehru University, New Delhi. This complex is nearing completion. A photograph of the complex is being carried on the back cover of this Report.

Annexure to Chapter 6

Growth of Technical Institutions in the Country (UNDER GRADUATE)

Year	Engg	Phar	Arch	HMCT
2006-07	1511	665	82	64
2007-08	1668	854	82	73
2008-09	2388	985	82	81
2009-10	2972	1029	82	81
2010-11	3222	1041	84	83
2011-12	3286	1053	84	83
2012-13	3369	1036	100	80
2013-14	3384	1029	105	81
2014-15	3389	1023	115	78

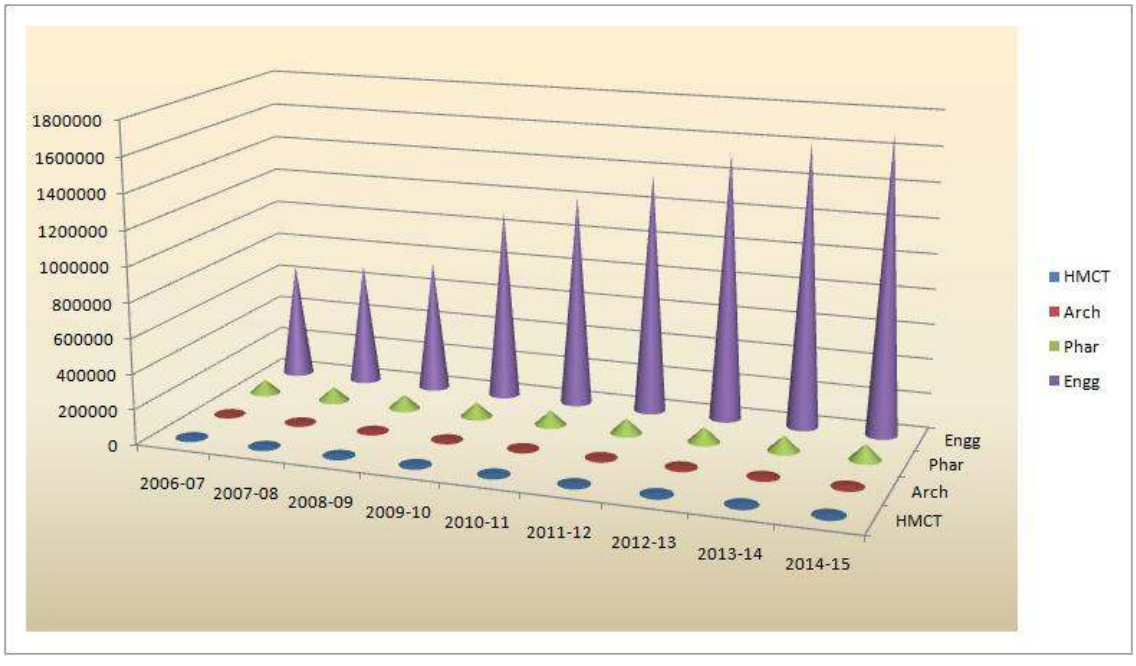
BARCHART Growth of Technical Institutions in the Country (UNDER GRADUATE)



Growth of INTAKE of Technical Institutions in the Country (UNDER GRADUATE)

Year	Engg	Phar	Arch	HMCT
2006-07	659717	76030	5085	5840
2007-08	701214	77582	5189	5959
2008-09	753910	78763	5268	6050
2009-10	1093380	80370	5375	6174
2010-11	1219347	81594	5457	6268
2011-12	1379149	83259	5568	6395
2012-13	1538767	83519	7325	6160
2013-14	1620958	85474	8144	6520
2014-15	1693771	88950	10014	6400

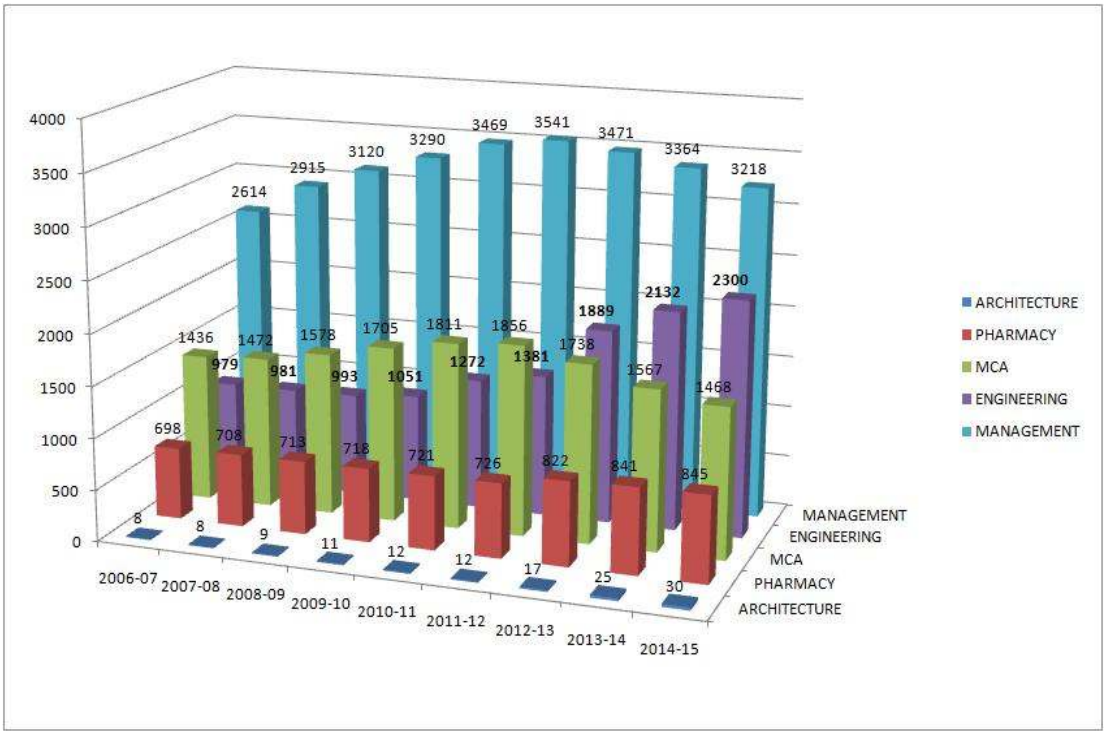
Growth of INTAKE of Technical Institutions in the Country (UNDER GRADUATE)



Growth of Technical Institutions in the Country (POST GRADUATE)

	MANAGEMENT	MCA	ENGINEERING AND TECHNOLOGY	PHARMACY	ARCHITECTURE AND TOWN PLANNING
2006-07	2614	1436	979	698	8
2007-08	2915	1472	981	708	8
2008-09	3120	1578	993	713	9
2009-10	3290	1705	1051	718	11
2010-11	3469	1811	1272	721	12
2011-12	3541	1856	1381	726	12
2012-13	3471	1738	1889	822	17
2013-14	3364	1567	2132	841	25
2014-15	3218	1468	2300	845	30

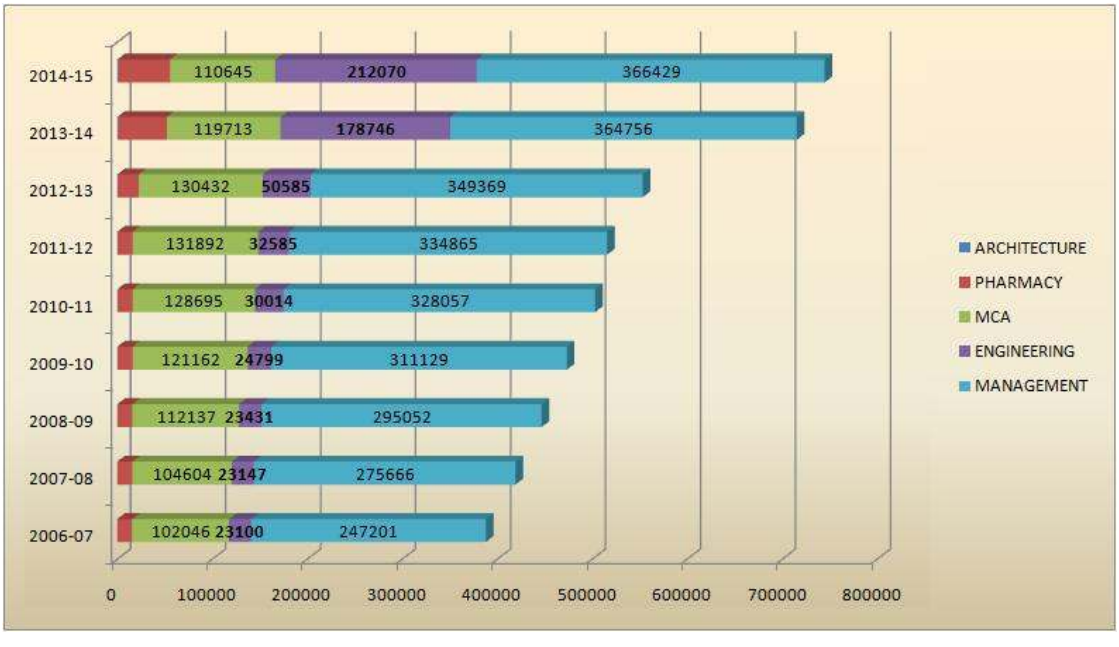
Growth of Technical Institutions in the Country (POST GRADUATE)



Growth of INTAKE of Technical Institutions in the Country (POST GRADUATE)

	MANAGEMENT	MCA	ENGINEERING AND TECHNOLOGY	PHARMACY	ARCHITECTURE AND TOWN PLANNING
2006-07	247201	102046	23100	15570	154
2007-08	275666	104604	23147	15793	154
2008-09	295052	112137	23431	15905	174
2009-10	311129	121162	24799	16016	212
2010-11	328057	128695	30014	16083	231
2011-12	334865	131892	32585	16194	231
2012-13	349369	130432	50585	22400	364
2013-14	364756	119713	178746	51228	936
2014-15	366429	110645	212070	54692	1056

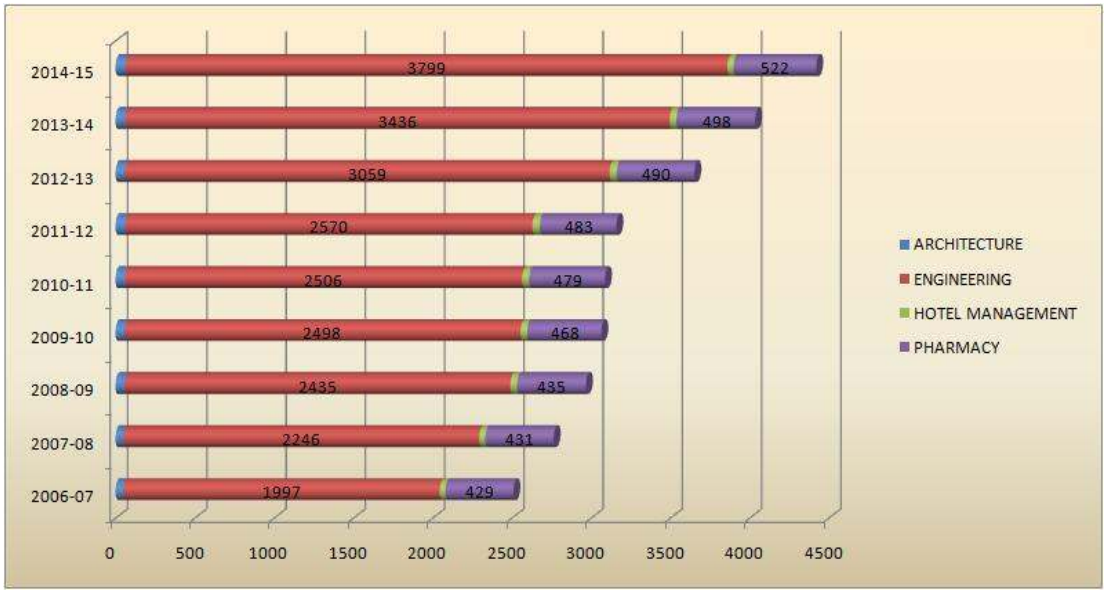
Growth of INTAKE of Technical Institutions in the Country (POST GRADUATE)



Growth of Technical Institutions in the Country (DIPLOMA)

YEAR	ARCHITECTURE AND TOWN PLANNING	ENGINEERING AND TECHNOLOGY	HOTEL MANAGEMENT AND CATERING	PHARMACY
2006-07	49	1997	36	429
2007-08	49	2246	39	431
2008-09	57	2435	42	435
2009-10	58	2498	42	468
2010-11	60	2506	44	479
2011-12	61	2570	47	483
2012-13	59	3059	45	490
2013-14	61	3436	42	498
2014-15	62	3799	39	522

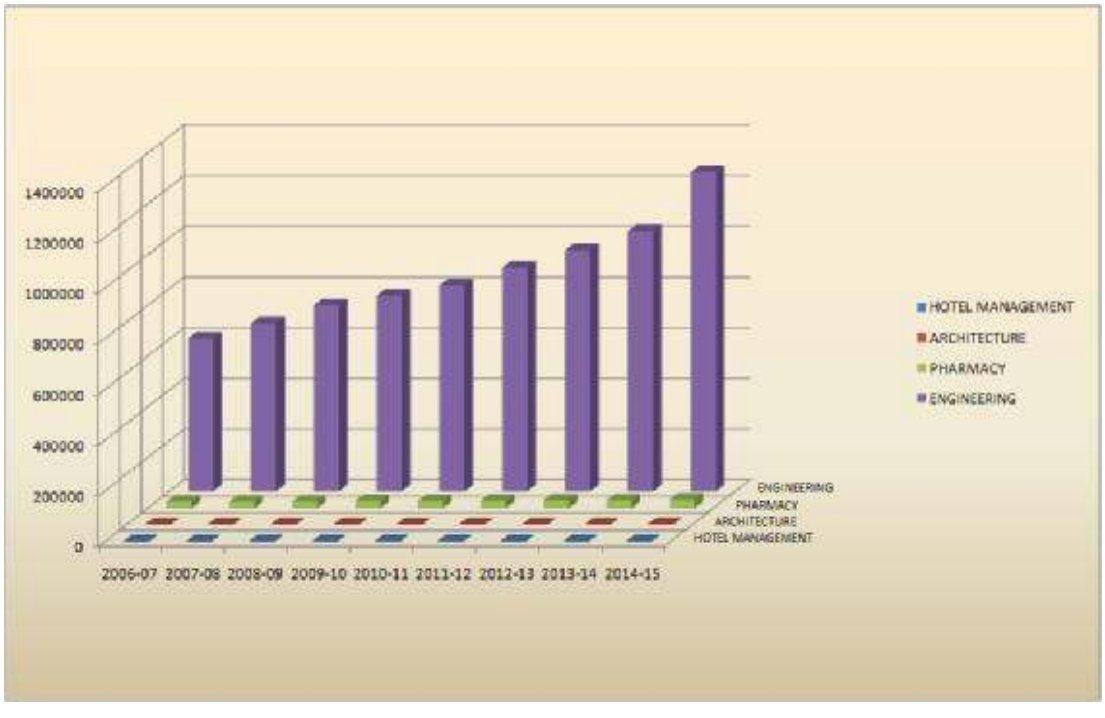
Growth of Technical Institutions in the Country (DIPLOMA)



Growth of INTAKE of Technical Institutions in the Country (DIPLOMA)

	ARCHITECTURE	ENGINEERING AND TECHNOLOGY	HOTEL MANAGEMENT AND CATERING	PHARMACY
2006-07	2361	603318	2356	25948
2007-08	2361	662409	2552	26069
2008-09	2746	734491	2748	26311
2009-10	2794	771851	2748	28307
2010-11	2890	812786	2879	28973
2011-12	2938	882489	3075	29214
2012-13	3008	951050	3015	30574
2013-14	3008	1027567	2775	31276
2014-15	3438	1259352	2765	34246

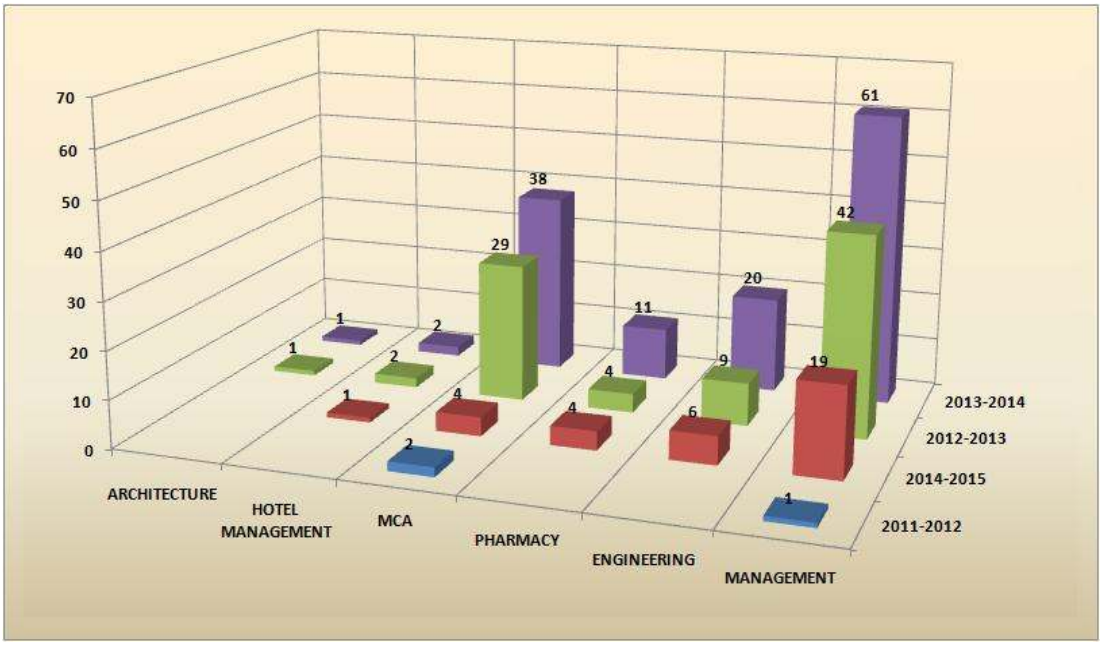
Growth of INTAKE of Technical Institutions in the Country (DIPLOMA)



Institute Closure Approved

Year	MANA-GEMENT	MCA	ENGI-NEERING	PHARMACY	ARCHITE-CTURE	HOTEL MANAGEMENT
2011-2012	1	2				
2012-2013	42	29	9	4	1	2
2013-2014	61	38	20	11	1	2
2014-2015	19	4	6	4		1

Bar chart Institute Closure Approved



Chapter 7

Critical review of AICTE's performance

In the first place God made idiots. This was for practice. Then He made school boards
Mark Twain

7.1 Under the Terms of Reference, the Committee has been asked to undertake a performance review of the functioning of the AICTE.

7.2 Such a review can be undertaken in a variety of ways. We can take relevant extracts from the reports of expert committees, we can look at the observations made by organs of the Government, we can quote the obiter dicta of the courts, and then there are the conclusions arrived at by experts in articles published in newspapers and magazines.

7.3 **Report of the U.R.Rao Committee, 2003**

We are looking at the situation over the period 2001-2014. Reports of the various Committees set up by the Government to review the functioning of the AICTE can be taken as a somewhat credible source of information. The first of such committees was the U.R.Rao Committee which submitted its report in September 2003.

7.4 The highlights of its review were the following:

i) There had been an explosive growth in the number of technical institutions and therefore in the number of technical personnel. The Planning Commission had estimated that the percentage of unemployed engineering graduates was more than 20%.

ii) There was a tremendous shortage of faculty for imparting post- graduate education. The Committee estimated a requirement of over 10,000 Ph.Ds. over the next 3-4 years.

iii) There was an enormous inequity in the growth of technical institutions across regions.

iv) There was an improvement in the approval cycle of new institutions, but the process still took about 8-12 months.

v) More than 5 lakh school students sought admission to technical institutions every

year. They were compelled to appear in a multiplicity of entrance tests.

vi) Most unaided institutions were charging exorbitant fees.

vii) The AICTE had issued regulations to control the entry of foreign institutions.

7.5 **Report to the Nation, National Knowledge Commission, 2006:**

The National Knowledge Commission recommended the setting up of an Independent Regulatory Authority for Higher Education (IRAHE) for four important reasons:

"First, it would minimise conflicts of interest as it would create an arm's length distance from the stakeholders. Secondly, it would replace the existing system which is over-regulated but under-governed, through more appropriate forms of intervention. Third, it would rationalise the present system where mandates are both confusing and overlapping. Fourth, it would dispense with a multiplicity of regulatory agencies to provide a single window clearance."

7.6 **Working Group on Management Education, 2007**

This Working Group set up under the chairmanship of Shri P.M.Sinha surveyed the situation in respect of management education and came to the following conclusions:

(i) Growth in the number of business schools has accelerated over the last two decades, partly due to increased rate of growth of the economy and partly due to the entrepreneurial initiative of promoters to seize commercial opportunities in education.

(ii) The regulatory framework and implementation has a control perspective focussing on inputs such as land, faculty and other infrastructure rather than on the outcomes such as quality of education, research, access, cost effectiveness or relevance.

(iii) AICTE focuses more on taking punitive measures on those institutions that are not approved by the AICTE rather than on promoting the development of the more promising ones.

(iv) Management is seen as a sub-department of engineering rather than recognising that management itself has its demands that require exclusive attention.

(v) Professional staffing in AICTE is not full-time and the existence of most staff on deputation for short durations has made the regulatory process highly rule-based rather than quality-based. No organisational learning is taking place and organisational memory is not accumulating.

7.7 **Working Group on Technical Education for the Twelfth Plan:**

The Ministry of Human Resource Development, Government Of India set up its Working group on Technical Education for the XIIth Five Year Plan. It presented its report in September 2011.

7.8 It noted that the number of AICTE-approved institutions had almost doubled during the XI th plan period. Major reforms were undertaken in the functioning of AICTE. It adopted a facilitating approach with a shift from a regime of inspections to that of voluntary self-disclosure coupled with stiff penalties in case of misrepresentation. The processing of applications was started electronically from the year 2010-11 with a view to transforming AICTE into a facilitating body, based on rules, open to scrutiny and RTI-compliant.

7.9 **Comments by experts**

Experts, however, are not impressed. Shri Gurcharan Das, commenting on 10th February 2008 in the Times of India referred to the Indian School of Business, Hyderabad, which was the first Indian business school to be ranked at serial number 20 in a list of 100 schools of the world. It refused to seek AICTE accreditation because then the Council would decide their course content, determine the student intake and even lay down the size of their buildings. A senior AICTE functionary confessed that they would not approve ISB because it charged very high fees and had no permanent faculty. Das told him that the faculty was flown in from all over the world, the fees were high but they matched the salaries the graduates commanded and each student got a loan. The AICTE official was unconvinced.

7.10 Another expert confided in the Committee during his oral evidence, "If I were asked to rate AICTE on a scale of one to ten, I would rate its performance at 1!"

7.11 When the MHRD appointed the present committee, the New Indian Express dated 31st October 2014 reported: Welcoming this, a former Vice Chancellor, Anna University said, "The AICTE has powers but is not able to function independently."

7.12 Presently, AICTE only acts as the agency to approve new colleges. Ensuring quality of technical education is not done mainly due to political interference. The regulatory body should be given total autonomy."

7.13 **Court strictures:**

The Supreme Court was reported by Mail Today dated 22nd October 2014 to have passed strictures against AICTE as under:

"It is inconceivable that the authorities who are in charge of controlling the sphere of education to behave like errant knights justifying their own fanciful deeds…Law expects a rational perception, logical approach and a studied and well deliberated decision from all authorities."

7.14 The Times of India dated 15 November 2013 reported a ruling of the Madras High Court that: "An apex body like the AICTE must be in a position to identify premier institutions and encourage them to give good technical education for an affordable fee. Similarly, efforts should be made to close down makeshift engineering institutions which are a source of threat in the field of education."

7.15 DNA reported on 4th January 2013 that the Supreme Court had imposed a fine of Rs. 50,000 on AICTE for permitting Parshavanath College of Engineering in Thane to operate, despite its failure to fulfil the requisite criteria for it. In September 2012, the Aurangabad bench of the Bombay High Court had also imposed a fine of Rs. 1 lakh on AICTE for wrongfully disaffiliating an Aurangabad-- based engineering college, as its infrastructure did not meet the norms.

7.16 **Comments by bureaucrats:**

The Times of India dated 20th May 2013 quoted a top bureaucrat of Maharashtra Government as saying: "The AICTE approved 11 new colleges although the state Government had warned it that nearly 1.44 lakh engineering, management and architecture seats were lying vacant. We are shocked and surprised over the manner AICTE sanctioned new degree and diploma colleges. We fear that in view of surplus seats all over the state and with opening of new colleges, several colleges will have to be closed down."

7.17 **Self-assessment by Chairman AICTE:**

Prof. S. S. Mantha, outgoing Chairman AICTE made a presentation before the Committee about the achievements of the organisation. Naturally, he gave a laudatory assessment. The main points he made were as under:

7.18 There has been a quantum jump in the expansion of the technical education system in the country. While there were only 43 institutions in 1947, the number of institutions rose to 10,500 and they ran 14,000 programmes at 18000 different levels.

7.19 Much of the growth took place in the last decade. There has been a quantum jump in the number of private institutions. This has increased access manifold and increased the

GER. A large part of this boom is in the small towns and rural areas, thus serving the neglected regions and catering to the population in mofussil areas.

7.20 Since 2010 a robust e-governance project has been implemented. This has speeded up the process of approval, so that a new institution is now approved within three months. Applications are filed on-line and processing is on- line too. The human interface has been reduced substantially. This has enhanced credibility, transparency and accountability.

7.21 The Council has been functioning from rented premises. Now its own building has come up in JNU Campus, New Delhi.

7.22 India has become a signatory to the Washington Accord. The National Board of Accreditation has been made autonomous and is no longer under the administrative control of the Council.

7.23 As against just 4 regional offices in 1987, the Council has now established 10 regional and camp offices. This has enhanced its administrative reach.

7.24 The aspect of regulatory jurisdiction of the various bodies is a matter of concern and needs to be sorted out.

7.25 **Assessment by the MHRD:**

The views of the Ministry of Human Resource Development have not been formally presented to us. It is understandable that the Ministry would not like to be seen as critical of its own organisation.

7.26 However, one can guess at the general impression in the Ministry from a reading of the Terms of reference of the Committee. Some of the more obvious comments are summarised below:

7.27 It is obvious that there has been a massive expansion of technical education in the country over the last twenty years. Most of it is accounted for by the private sector.

7.28 There is a realisation that the AICTE is finding it difficult to meet the challenges thrown up by the private players, especially in respect of meeting the norms laid down by the regulator, the evil aspects of commercialisation and globalisation and the onset of corruption.

7.29 The introduction of e-governance in processing of cases in the Council has speeded up the process. An application for the approval of a new institution now takes not more than

three months. However, much more needs to be done so as to make all the data public and keep it up to date at all times.

7.30 There is need for a scientific and quick estimation of demand for various kinds of technical manpower, and to set up an organisational framework or outsource the task.

7.31 A robust accreditation system has to be put in place.

7.32 AICTE has to move from the role of a regulator to the much more difficult role of a facilitator and a mentor.

7.33 **Evidence before the Review Committee**

Numerous witnesses appeared before the Review Committee or submitted memoranda. Many of them made disclosures in strict confidence which could not be taken on record for obvious reasons. Some of them held the positions of Chairman, Vice-Chairman or Member Secretary of the AICTE or that of director or professor of higher technical institutions. The Committee has every reason to believe their evidence, especially as their versions were identical in many respects.

7.34 The gist of what they told us was that the malfunctioning of the AICTE was not primarily due to any defects in the functioning of the top leadership. They were under tremendous pressure from influential lobbies to turn a Nelson's eye to the deficiencies in infrastructure, size and quality of faculty or the other laid down norms. Top political, bureaucratic and industry potentates exercised pressure on the AICTE to get the necessary approvals. Many of them were in fact the benami owners of the educational institutions and would not take "No!" for an answer.

7.35 Most of them pointed out that the present mode of functioning made AICTE a classic case of too much government and too little governance. History had proved time and again that governmental interference was the kiss of death. The Indian film industry and information technology were two examples of sectors that flourished despite the neglect by Government. Rather they flourished because they were neglected.

7.36 The moral of the story was that there had to be a total transformation of AICTE's role. The extremists ventured to suggest that AICTE should be abolished and nothing put in its place. "Let a thousand flowers bloom," they proclaimed and quoted the example of the US which had left everything to the market forces.

7.37 Moderate observers felt that AICTE should remain but in a different avatar. It should be less of a regulator and more of a developer and mentor.

7.38 **A Summing Up:**

Some general observations of the Committee after listening to the various stakeholders are as under:

7.39 The AICTE is playing a crucial role in upgrading and developing the technical education system in the country. However, it has overstressed its role as a regulator with the result that it is often seen as a bastion of the licence-permit raj in the field of education.

7.40 The private sector seems to be playing a double game. On the one hand, it misuses the weaknesses of the present system to obtain undeserved approvals and is sometimes exposed. Resultantly, the regulator also earns a bad name. On the other hand, the private players are in the vanguard of those stakeholders who are constantly campaigning for cutting down on its regulatory powers.

7.41 In the fight for regulatory space, AICTE seems to be fighting a losing battle. The UGC has the backing of the Supreme Court. The management lobby seems to be itching for a showdown. The subject matter Councils want freedom from its clutches. A balanced view needs to be taken by the MHRD and be reflected in the various statutory provisions, so as to leave no room for ambiguity.

7.42 If the AICTE is to play a significant role for the development of India as a technical education superpower, its status needs to be autonomous, the selection of the top leadership has to be fair and transparent, and the organisation has to be insulated against political pressures of all kinds. Above all, the Government has to place a substantial block grant at its disposal so that it can really play an effective role as an agency for rapid development.

Chapter 8

Global status: some experiences from other countries

To expect the unexpected shows a thoroughly modern outlook
Oscar Wilde

8.1 When we look at taking our higher technical education system to the next level, which in turn will enhance the enormous potential offered by the demographic dividend – a feature unique to India, it is important that we take a brief look at what are the approaches to higher technical education around the globe. Of course, it is not possible to look at all the countries around the world (more than 204 as per those who participate in the Olympics). Moreover, a look around will help us calibrate ourselves.

8.2 Some of the key aspects of education, in most of the developed world, are: autonomy, democratization, lifelong learning, dynamism, interdisciplinarity and response to, and adaptation of changing technology. The educational system in the developed world has very little regulation. The state's role is more as a promoter, mentoring, and enabling technical education rather than a regulator. Whatever little regulation is required is routine and approvals are very quick. The fundamental belief is that excellence flourishes when there is a high degree of autonomy and very minimal regulation. Quality assurance is achieved through accreditation. Market forces do play a major role.

8.3 It is surprising, perhaps shocking, that there are only four countries in the world that have regulated and affiliated college system of technical education. As examples of non-affiliating countries in the rest of the world, in this report we are looking at two countries – the United States of America and Germany. Most countries with quality education have a similar system.

8.4 **Higher Education Model in United States of America**

Today, if one looks around the globe, one of the best education models exists in the US (Why does the US dominate university league tables? http://www.uq.edu.au/economics/abstract/391.pdf). This is not because USA has Stanford, MIT or UC-Berkeley. Of course these institutions play a key role, and more often than not, set the standards and programs for higher education that are followed the world over. The strength of the US system lies in the fact that, when it comes to undergraduate

education, even Tier II and Tier III universities excel. The name to fame for top 20 or top 50 US universities is because of doctoral education system – a research eco-system – which is their prime focus. And they do this without compromising on excellent undergraduate education.

8.5 The question arises: What is it that makes the US education system one of the best?

Apart from reading the literature on the subject, what follows is also based on personal discussions of some of the committee members with senior faculty and management at US universities.

8.6 There is no single answer to the question – one has to contend with many interrelated answers.

8.7 The US system of higher technical education is basically unregulated. It relies on internal checks and balances, and uses accreditation process to assure quality and relevance of outcomes. The fundamental tenet is: autonomy is important for excellence and quality outcomes (please see -- The Governance and Performance of Research Universities: Evidence from Europe and the U.S. http://www.nber.org/papers/w14851).

8.8 In US, there are fundamentally three kinds of institutions for higher education: (i) State Universities (like Univ. of California, Univ. of Michigan, etc.), (ii) Private not for profit Universities (like Stanford, MIT, Princeton, University of Southern California, etc.), and (iii) for profit Universities (like Phoenix Universities). US leadership in education lies in excellent state universities and excellent private not for profit universities. For profit universities are not respected much in the US.

8.9 If one were to start a new state university (like what was done in 2005 for starting University of California, Merced Campus) one does need approval from the state. The reason for approval is to get financial support from the state to run the university. Nevertheless, once the University is approved, it has full academic autonomy. Of course, the Board of Governors (BoG) will be appointed by the state. Along with the BoG, the state will have a say in appointing the President of the University. The appointment of Provost, faculty, etc. is under the purview of the University (this model is akin to what we have for IITs). To start a new program, one does need to take approval from the state – but this is a routine matter and settled expeditiously. This approval is more related to finances for state universities.

8.10 Starting a private Not for Profit University in the US, is almost like starting a company. Private universities are essentially a corporation; the governing structure is similar to a

corporation. Typically, they would have a Board of Trustees (BoT); BoTs are major stake holders. A BoT appoints the President, who in turn appoints the Provost and so on. The BoT does not interfere with the academic programs. Nevertheless, BoT approval is required for starting a new program – once again the approval is more related to finances.

8.11 Even though the US system of higher education is pretty much unregulated, there is tremendous pressure on maintaining quality and excellence. This is enforced by an accreditation process, more often than not, ABET - www.abet.org. There are other agencies like (WASC - Western Association of Schools and Colleges http://en.wikipedia.org/wiki/Western_Association_of_Schools_and_Colleges, Middle States Commission on Higher Education http://www.msche.org/?Nav1=ABOUT&Nav2=MISSION – but these are regional). All these accreditation agencies force programs to think about what outcomes in the program will be accomplished, and also how to continuously improve the program outcomes. It is to be noted that an accreditation body does not define the outcomes, it looks at the objectives and outcomes defined by the university and accredits them against these outcomes. ABET accreditation is peer based, i.e. the accreditation committee consists exclusively of academicians. In fact, peer based assessment is fundamental and at the core of all education processes in the US, and has worked very well. Accreditation is essentially a self-regulatory mechanism and works like a feedback control system.

8.12 Though there are no real regulatory mechanisms in the US, there are enough built in checks and balances to force quality control and have quality assurance.

8.13 Accreditation is also important to get financial support from the state – this applies to state universities and also to private not-for-profit universities (when they want state financial support).

8.14 ABET does accreditation for undergraduate programs only. US also has regional groupings that look at graduate programs – for example, Purdue University is governed by the North-Central group.

8.15 Besides accreditation, most universities of repute go through periodic exercises where they invite leaders from other universities to come in and assess the progress, plans and future directions.

8.16 rating of universities is done by self-appointed bodies, like US News, etc. People do give credence to it. These ratings are based on surveys. From what one could gather, there is a very good correlation between accreditation and rating.

8.17 It is to be noted that some universities of exceptional repute may not go for accreditation; a case in point is MIT.

8.18 There are some fundamental changes taking place in the US higher educational system because of online learning. It is difficult to envisage how this will fan out in the future. There was an exercise conducted at d-School Stanford University entitled Stanford 2025 --- http://www.stanford2025.com/#intro. The core change that one could detect is that students will not be subjected to a program, but the student will have a choice of small programs using which he or she can educate themselves – something like a smorgasbord of programs. They talk of paced education, axis flip education, purposive learning, etc.

Higher Education Model in Germany

8.19 There are two types of university systems in Germany

1. University
2. University of Applied Sciences (Fachhochschule)

8.20 The Universities provide academic education and are research- oriented. Whereas Universities of Applied Sciences give more practice based and job centric education. They are more in numbers compared to the Universities. Both Universities and Universities of Applied Sciences are practically independent and are unregulated. However, the Universities of Applied Sciences cannot give PhD degrees and are mostly teaching oriented. On an average, each faculty teaches 21 hrs a week in the University of Applied Sciences. They offer diploma and masters and are treated differently from the diploma and masters awarded by the Universities. However, for starting any new program, both Universities and Universities of Applied Sciences have to take permission from the state. Nevertheless, design of the program entirely remains with the universities.

8.21 There are no federally funded (centrally funded) or private universities in Germany. All Universities are state funded Universities. The state provides funds for the teaching and infrastructure development of the Universities. For the funding, the Universities will have to negotiate with the state government. However, once the state clears the funding they have enough flexibility in utilizing that money. Most of the money from the state government goes into salary and teaching. Any leftover money can be used for research funding and the universities do not need the state's permission for utilizing it under different heads. Most of the research work and PhD positions (almost fully) are funded from external projects. Germany does not have private Universities and only the state

can start new Universities. Big infrastructures are developed in partnership mode by the University, State Government and the Federal government.

Conclusion

8.22 From both the cases cited above, one sees that higher technical educational institutions in developed countries enjoy full academic and financial autonomy –albeit, allocations of the funds may be controlled by the government – but there is autonomy in spending.

8.23 Regulation is a counter to excellence; one could say it thwarts excellence. There has to be a strong system of internal checks and balances to assure quality.

Chapter 9

A vision for the future

Do not confine your children to your own learning, for they were born in another time
(unknown)

9.1 Societal Gradient vs Education Gradient

In order to create a vision for the future of education it is useful, though not imperative, to look at the ambience in which today's youth is growing and also try to get some feel for the aspirations of the youth.

9.2 20 years ago, cell phones were pretty much non-existent, forget smart phones. Computers were just making forays in banking, railways, etc. and that too with great reluctance. Google was operating from Stanford University under the site google.stanford.edu and z.stanford.edu. Most professors walked on campus or rode a bicycle – a ride in Fiat's Premier Padmini was a luxury. Words like i-pod, i-phones had no meaning. One can go on.

9.3 Jump to the present – youth has grown up with technology – in fact, they breath technology, they articulate technology – India has a billion cell phones, bulk of them smart phones – electronic gadgets are commonplace – information is on finger tips – literally. Automation is on the increase – and much more is on its way --just wait for the next revolution with Internet of Things and Digital Fabrication. Television is everywhere and anywhere; even in remote parts of India, and boasts of maximum number of channels in the world. Thus, one may conclude, the rate of change in our society – societal gradient – in the last 20 years has been phenomenal. This has enhanced the aspiration of the youth – perhaps unprecedented in independent India.

9.4 Compare this with the rate of change in education – the education gradient. We still teach pretty much the same things – using the same books or rehash of classic books on the subject, and often using the same yellow notes. Technology is used – black board changed to white boards which in turn changed to ppts or pdfs. But really no profound change in teaching content, methodology or delivery. In fact, more often than not, teaching becomes imparting information – which was acceptable decades ago when access to information was either not there or was delayed by months and years. But in

today's time, information is on finger tips! One may conclude that the education gradient is very low.

9.5 Among several other reasons, this mismatch between societal and education gradients is one of the key factors that creates discontent among the students. Society is very dynamic, while in comparison, the educational system is pretty much static.

The Future – A Crystal Ball Exercise

9.6 **Dynamism:**

Future educational system will have to be highly dynamic – essentially making the education system agile so that it quickly responds to changes in science, technology and aspirations of the youth. It has to quickly respond to societal changes. If new developments take place in STEM (Science, Technology, Engineering and Mathematics) they must instantly find their way into the educational curriculum.

9.7 **Modularity:**

Future education will have to be modular in nature – length, breadth and the depth of the module will be variable and will depend on the subject. This will facilitate flexibility and help develop a self-paced education system. In fact, in the modular system some courses could spread over time, while some could be intense and get completed over a couple of days – 14 to 16 hours in two days. Essentially we will move towards a fractional credit or equivalently a micro credit structure. Credits will be a function of the length, depth and breadth of the module.

9.8 **Credit and Mobility System:**

Modularity, and flexibility will also enable mobility and credit transfer. Fundamentally, education will be based on clearing credits . On accumulating a certain number of specified credits, one will get the degree. Moreover, one can move from one place to another and carry forward the cleared (accumulated credits) – almost like bank accounts. Another variable that will come in will be recognition for completing part of the total credits. If a student decides to leave after clearing part of the total number of credits say, 50% of the total credits, she could be given a diploma or certificate, etc. She also has the option of coming back after a few years to clear the remaining number of credits and get the final degree. The part credit completion could be a graded process, e.g. 33% credit completing, 70% credit completion, and finally 100% credit completion. Also, in the credit mobility system it will be possible to transfer credits, taken at a sister institution, to the parent institution. Moreover, in the Credit and Mobility System – a student can

change her domain or specialization -- if there is a major change she will have to spend extra time to get the degree. Thus, in a broad sense, credit and mobility is not only for moving from one place to another, but also for moving from one stage in life to another.

9.9 **Nonlinearity, Flexibility and Self-Paced:**

Many things in the world are moving towards a nonlinear, asynchronous system – Internet is inherently nonlinear – we all access information in a nonlinear fashion, video on demand is nonlinear, integration of knowledge and information is a nonlinear process .So why not education? The word nonlinearity should not be confused with chaos – nonlinear systems indeed have a systematic approach as evident by nonlinear equations in mathematics. Thus a student can choose her path to education. Of course, nonlinearity will work if there is flexibility in the system. Thus another attribute of the future educational system will have to be flexibility. Dynamism coupled with flexibility will enable the students, albeit with guidance, to design her own curriculum. Each student will pace herself – we will move away from the present system of one size fits all. Customization is the future in technology and this has to be the case with education too.

9.10 **Courage:**

Future education will need to impart courage to our students to think innovatively, think differently, courage to challenge and if need be break established norms in technology and engineering. Today's education teaches students acceptance and not courage to challenge. Courage is very vital to create an innovative ecosystem. If we look around the world, path breaking technologies have occurred when the inventor / innovator had the courage to challenge an established practice. Thus, future education must inculcate the courage for uninhibited thinking. Courageous approach will lead to mistakes. Consequently, along with courage we need to teach them that committing mistakes is part of the learning process, part of invention and innovations. Mistakes, though unpleasant, are as much a teacher, perhaps more so, as successes.

9.11 **Design Spine:**

Today, creative design is becoming as important as engineering. With advent of new technologies, like digital fabrication and interactive graphics, the divide between creative design and engineering design is being bridged. Product development is not only about engineering and technology but is also about creative design. Thus, it is imperative that we incorporate a design spine in the educational curriculum. One can exploit modularity, mobility and credit transfer to execute the design spine – the idea being that courses in creative design could be taken from those institutions which have

the expertise and then the credits can be transferred. Also the credits could be fractionalized. It is not necessary for individual institutes to have design expertise. Of course, one can built expertise at the parent institute and offer the design spine. The key aspect is that we create design thinking among students – design thinking is not only engineering or aesthetics but also for all aspects of life.

9.12 **Experiential Learning:**

In modern times, as technology and Internet become all pervasive, students will have easy access to information, lecture notes, presentations, video lectures and all that, from all around the world. They will soon start questioning the relevance of lectures – which they will find not just monotonous, but perhaps redundant. The future requires experiential learning which has several components: teaching and learning will involve lot more project work – in fact, here too the projects will be chosen by students – they will not be assigned. Classes will involve group discussions, problem posing, problem solving, posing challenges and possibly tackling challenges. Teacher will not be a teacher but will be a mentor, a guide, an advisor, a moderator, a bouncing board for ideas and challenges. Students will not be writing exams – they will write white papers, technical papers, business plans, thought provoking papers, questioning papers, challenging papers and make formal presentation on all these. In essence, learning will not be through lectures and exams but through an experiential behavior emanating from the medium of projects, discussions, presentations and what have you. Experiential learning will of course involve a strong industrial interaction – either on site or having industry personnel spending time at educational institutions.

9.13 **Earn While You Learn:**

In a vast country like India with varying economic structure, there will always be a large percentage of students who like the option of earning while going through college. Many a time this may be dictated by the economic background of the student. In the flexible credit transfer- based model, this aspect can be very easily incorporated. A student will have the flexibility of selecting enough credits so that she will have time left to earn a living. It is likely that the student would take more than the required number of years to accumulate the desired number of credits for a degree.

9.14 **Education on Smart Phones:**

India has nearly a billion mobile phone subscribers and most of them are smart phones. This platform is getting more powerful every day and is capable of doing a lot more than

what it was designed for. In fact, in times to come, a phone call will become one of the thousand other things that you can do on the smart phone. Smart phone today is used for health care (counting your heart beat, number of steps you have walked etc. . .), for social networking with WhatsApp, Google-hangout, Facebook and so on. There are GIS apps so that you can navigate yourself in cars and also while walking in any city or town in the world. I am sure one can cite many more examples. But one thing missing is, apps for education. In future it will be the smart phone platform which will dominate online education – there will be versions of MOOCS on smart phones, distance education modules, interactive science and technology, ask me anything sessions, etc. Moreover, all these will be voice and gesture active applications. For future education systems, to reap the demographic dividend, it is imperative that the smart phone platform is exploited to the maximum.

9.15 Churn

Our educational system is by and large static. If at all there are changes – these are incremental and that too after others in the world have implemented it. Somehow our psyche requires assurance before we implement ideas. The future educational system will be autonomous wherein experimentation with the system itself will be part of the ecosystem. In fact, a regular and frequent churn in the educational system is a must – it is only through frequent churns that we will be dynamic and keep innovating so that the system keeps pace with changing timesand does not get outdated. The system will have to provide the freedom to the teachers to experiment with innovative pedagogy without the fear of failing. It is indeed a challenge to create an ecosystem of experimentation within the system itself – in fact, this is the hall mark of all advanced systems – stability in a highly dynamic system. You attain stability by constantly changing and not by remaining static – something like a two wheeler – the system is constantly rotating but still maintains stability.

9.16 Job Creators and not Job Seekers

Entrepreneurship has started making its presence felt on several of the educational campuses. Start-up culture is catching the attention of the young graduates. But it needs to proliferate a thousand times. In future, our education system should graduate not just job seekers but job creators. This is a tall order and one is well aware that not everyone can be a job creator. But, an ecosystem of job creation must be cultivated in the education system.

9.17 **Conclusion**

The future education systems will be defined by mobility, credit transfer, nonlinearity, flexibility, agility, modularity, intensity, diversity, churn and experientiality. The new vision for education has to be far reaching and should not be dictated by immediate needs.

9.18 If India has to keep pace with the rest of the world and adjust to the newly emerging realities of the educational scene, we shall have to redesign all our institutions, policies, structures, procedures and processes. There has to be lot of autonomy, lot of experimentation, lot of trust and courage, and an ecosystem imbued with a whole lot of dynamism and faith.

Chapter 10

Policy framework

2015 will be the year of the Skill India initiative
Narendra Modi

10.1 The policy framework for the technical education sector has to form an integral part of the overall policy frame for education as a whole.

10.2 **Universalization of Elementary Education**

Education was brought into the concurrent list of the Constitution of India in 1976 and thereafter became the joint responsibility of the Central and State Governments. Even so, the Central Government played a minor role for a while and initially started with two half-hearted schemes for Mid-day Meals in schools and the Operation Blackboard.

10.3 It was the promulgation of the Sarva Shiksha Abhiyan as a joint venture of the Central and State Governments, the declaration of elementary education as a Fundamental Right instead of a mere Directive Principle of State Policy and the passing of the Right to Education Act which galvanised the State players in the field of elementary education.

10.4 Although the national literacy rate in India was shown as 74.07% in the 2011 Census, many observers feel even this to be an exaggerated claim. If literacy percentage is less, the pace of economic development is likely to stagger. Any attempt to convert India into a knowledge society is bound to fail unless the entire population becomes literate.

10.5 In order to make this happen, the management of schools will have to be delegated to panchayati raj institutions who can successfully supervise them. This is the only way we can put an effective check on the working of rural schools and check teacher absenteeism which is the bane of the public education system in our country.

10.6 Even this modest figure of literacy is based on a definition of a literate person being one who can read and write his name in any language. ASER annual surveys of those who attend school show that the quality of teaching in Government-run schools leaves much to be desired, with a major chunk of students who pass Class V having literacy and numeracy skills of only Class II level.

10.7 So any ambitious programme of improving technical education must start with a massive investment in elementary education in order to make 100% population literate in the true sense of the term.

10.8 **Skill India initiative**

About 10% of the youth who finish the 10+2 stage of education enter the 37,000 colleges that the country has. . 72% of all graduates are arts graduates who, by and large, find it a difficult task to find a suitably remunerative job. Thus opening of such colleges alone is not the complete or perfect solution. Rather we should wean away the youth towards vocational and technical education streams. It has been estimated that 80% of the schoolgoing population will have to be steered towards some form of vocational / technical education or the other.

10.9 In many foreign countries and even in some experimental schools in India, vocational education is part of the curriculum from the lowest class possible, even from class 2 in some instances. The aptitude and proficiency of each child is closely monitored by the school faculty. If India has to develop skills on a large scale in the entire population, we shall have to start vocational streams from Class 2 or at the worst at Class 5 stage.

10.10 To achieve this target, 2,25,000 higher secondary schools will have to be covered by VET. A large number of Industrial Training Institutes would also have to be set up.

10.10.1 In this connection, the latest initiative of the present government is worth mentioning. The Prime Minister has announced that the Skill India Initiative would be a major thrust area of his government. This initiative is being piloted by a brand new Ministry of Skill Development and Entrepreneurship which is coordinating the efforts of 30 Ministries. The objective is to train 500 million youth by the year 2020. 150 new Industrial Training Institutes and 5000 new Skill Development Centres will be set up. The year 2015 has been declared to be the year of the Skill India Initiative.

10.11 Of all new employment, only 1% is with the government, 2% with private organised sector and 97% with the private unorganised sector of the Micro, Small and Medium Enterprises (MSMEs). The main thrust of the new educational policy should be to arm the new entrants with skill sets which are in demand. Only thus can we take advantage of the demographic dividend that we are likely to possess.

10.12 Interestingly, the coaching business is getting bigger than the education business. The entrance examinations to higher technical institutions attract 8, 00,000 applications entailing an expenditure of Rs. 16,000 crore every year.

It is estimated that 150,000 to 1, 60,000 students leave India for foreign countries,

thus creating a foreign exchange outflow of US $11 billion per year.

10.13 India can become an educational hub for the world and earn US$ 100 billion per year within 15 to 20 years if we plan our educational policies in a dynamic manner, removing all the fetters and impediments that stand in the way.

10.14 A Deloitte study has recognised Indian education as a sunrise sector for investments. The education market in India is at present valued around US $150 billion and is poised for a major leap forward in the years to come.

10.15 There is an urgent need to decontrol and deregulate all the institutions of higher, medical and technical education. This will bring about fierce competition, lower the costs and improve the quality of education. Government should encourage the private investment and participation in all sectors of education. Tax incentives should be provided to private educational entrepreneurs for the next two decades.

10.16 The Government is likely to roll out a new education policy during the year2015-16.Some of the key initiatives include introduction of a credit transfer system for students and schemes like 'Padhe Bharat Badhe Bharat', ' Beti Bachao Beti Padhao Abhiyan', Campus Connect, Know Your College, Unnat Bharat Abhiyan, Study Webs for Active Learning for Young Aspiring Minds and so on.

10.17 India as a country has to spend a lot more on education than it is doing at present. The current expenditure on education is only about 3.4 % of the GDP, against at least 6% that has been promised for decades now. We spend barely 0.6% of the GDP on Higher Education against 2.7% in the US.

10.18 The budget proposals for the year 2015-16 show a rather mixed fare. There is a 10% reduction in the outlay for school education over the previous year. Although the budget provision for higher education shows an increase of 22% , this high percentage is misleading, as the increase has been calculated on the Revised estimates for 2014-15,which was substantially lower than the original Budget Estimates for 2014-15. It should also be remembered that bulk of the provision kept in BE 2015-16 is accounted for by the new IITs , Central universities and other higher technical institutions. The outlay for the AICTE remains at a depressingly low level. Even the Education Cess that was supposed to generate resources for the education sector has been withdrawn by the Finance Minister.

10.19 **An Overarching Policy Framework under Niti Aayog**

Another area which has been engaging the attention of policy makers is a coordinated policy framework for the entire area of higher education. Two attempts at creating an

overarching policy framework were made in the recent past. One was the concept of ERAHE (Exclusive Regulatory Authority for Higher Education) which had been mooted by the National Knowledge Commission. The other proposal was to set up an NCHER (National Commission for Higher Education and Research) by the amalgamation of the UGC, the AICTE, the Medical Council of India, the Dental Council of India, the Bar Council of India, the ICAR etc. as suggested by the Yash Pal Committee.

10.20 Such attempts are doomed to fail, given the proprietary attitude most Ministries of the Central Government have with regard to the autonomous educational authorities attached to them. Turf battles in Delhi have historically been bloody and violent and have never led to anything concrete.

10.21 However, the failure of such attempts in the past should not dispirit us. The lesson to be learnt is not the giving up of such attempts at coordination, but the forsaking of attempts at merger.

10.22 A recent innovation in institution building may possibly provide an answer. Suppose we set up a Higher Education Policy Panel under the Niti Aayog. It may not be resented that much. The panel could be chaired by the Prime Minister with all the concerned Central Ministers as members. The concerned Secretaries and Heads of the autonomous bodies and Chief Ministers of States could also be on the panel. The Niti Aayog could deliberate on the burning issues like capitation fees, management quota, approval mechanism for Greenfield institutions, mentoring and development of sub-standard institutions, the mechanism for rating and accreditation, the grant of graded autonomy and so on.

10.23 In order to ensure that the Policy Panel receives a correct position paper on every contentious issue, it has to be supported by a Committee of Experts on Higher Education, a high-powered think tank which should have educationists, industry top brass, thought leaders of economic policy, scientists and technologists of repute as members, and no politicians and bureaucrats.

10.24 Niti Aayog has been conceived as the combined think-tank of the Governments, both State and Central. Higher education is an obvious choice of a subject area crying out for concentrated attention on the evolution and implementation of a national policy.

Chapter 11

Education in human values

The mind is not a vessel to be filled, but a fire to be kindled
Plutarch

11.1 **EHV yet to receive the importance it deserves:** Although Education in Human Values (EHV) has been recommended by all the important Commissions and Committees appointed by the Government since independence, it has not as yet emerged, as it ought to have by now, as a major concern of our national education policy. It may be clarified right at the outset that by EHV we do not envisage any kind of religious instruction. EHV has to be totally secular. Recent initiatives by the present Government at the centre exemplify a novel approach to the universe of values.

11.2 Some telling examples may be cited here. The Swachchh Bharat programme involves a complete overhaul of the environmental aspects of our national behaviour. It touches several related programmes such as cleaning up of the Ganga, the Yamuna and other water bodies. It involves construction of thousands of lavatories for women. The Make in India initiative takes in its ambit self-reliance in manufacturing and production of items for export. A new paper on values and attitudes has been introduced in the civil services examination in order to ensure that only persons with the right values and attitudes enter the civil services.

11.3 Prof. Kireet Joshi, the doyen of educational philosophers of the country, pays the following tribute to the importance of EHV:

"Our educational objectives must include the idea of preparing a new kind of man who can consciously and progressively harmonise within himself the broad vision of a humanist and the skill of a technologist, the disciplined will-force of the moralist and the refined imagination of the artist, the scrupulous knowledge of the scientist and the sublime vision, wisdom and ever-growing perfection of a mystic."

11.4 Experiments involving different types of innovative EHV course inputs grew at IIT Delhi during the past 32 years. These started in 1983 under the guidance of Prof. D.S. Kothari with the introduction of a course input called "Science and Humanism: Towards a unified world-view."

11.5 Meanwhile, value education was also creating ripples in the policy circles of the general educational system. EHV received a forceful endorsement in the 86th Report of the Parliamentary Standing Committee of the HRD Ministry (which is known as the S.B.Chavan Committee report) submitted to both Houses of Parliament in 1999. It identified Truth, Righteous Conduct, Love, Peace and Non-violence as the five fundamental values that were eternal and universal, and could become the foundations of educational programmes. These represent the five domains of the human personality: intellectual, physical, emotional, psychological and spiritual. They are also correspondingly correlated with the five major objectives of education, namely: knowledge, skill, balance, vision and identity.

11.6 The Committee quoted with approval what Swami Vivekananda had said: "Education is not the amount of information that is put in your brain and runs riot there, undigested, all your life. We must have life building, man making, character making and assimilation of ideas."

11.7 **Views of the Supreme Court:**

The National Curricular Framework(NCF), 2000 which was based on the recommendations of the S.B.Chavan Committee was challenged in a writ petition before the Supreme Court of India. The Court held that the NCF did not violate the principle of secularism enshrined in the Constitution.

11.8 All institutions today have a Supreme Court mandated course on Ethics and Values. Each institution is left to evolve its own methods of offering this course. It could be lecture based, it could be based on group discussions. It could be based on taking up some projects, it could involve invited talks and it could involve a workshop. The key aspect is autonomy on how the course is to be offered. This concept of autonomy is in tune with the running theme of autonomy in this report.. Each year the course is different both in format and content.

11.9 **Initiatives taken by MHRD:**

Immediately after the judgement of the Supreme Court, Ministry of HRD took a number of steps to make a coordinated effort to promote EHV at all the levels of the educational system in the country.

11.10 National resource centres were set up in the NCERT for school education, NIEPA for college and university education, NCTE for teacher education, IIT Delhi for engineering education and IIM Lucknow for management education, while the entire programme was overseen by a Coordination Committee under the chairmanship of

Secretary HRD, Government of India. A Value Education Cell was created in the MHRD under the charge of a Deputy Secretary.

11.11 For a while, the programme got a big boost, with NCERT bringing out a Journal of Value Education. NEUPA held two conferences of Vice Chancellors and circulated a six -pronged compulsory course for being adopted by universities for all undergraduate students. The Ministry hosted a National Conference on merging the best of east and west in management education at Kolkata, followed by setting up of a Committee to pursue follow-up action in the AICTE.

11.12 As the work at IIT Delhi had been going on for quite a while, it really took off with the setting up of the National Resource Centre. Over the years they have held a number of workshops in order to develop resource material, run teacher training programmes and conduct implementational experiments on a widespread scale.

11.13 Their experiments and networking have demonstrated that the following factors seem to be important:

- It has to be universally applicable to all persons at all places and times.
- It should be logical and rational.
- It should permeate all levels of human activity viz. thought, behaviour, work and understanding.
- It should lead to harmony at all levels: the individual, the family, the society and Nature at large.
- It should be capable of being implemented in the present teaching- learning environment. It should enable continuous self-exploration and life-long self-evolution

11.14 **Other Models:**

There are numerous other models being experimented within the country today. An outstanding example is the Raj rishi model innovated by Prof. S.K.Chakorborty, former Director of IIM Calcutta who has been running a Management Centre for Human Values in Kolkata for the last several decades.

11.14.1 The Gujarat Technological University has launched a 48-hour course called "Contributor Personality Development Program" since January 2012. It is a required course for all the programs of the University and 3.5 lakh students have already passed the final examination.

11.14.2 Many other organisations have been running various kinds of EHV programmes for different levels of the educational hierarchy with varying degrees of success.

11.15 **Recommendations of the Review Committee:**

The Review Committee has considered the matter and arrived at the conclusion that action in right earnest is required to be initiated both at the level of the MHRD and at the level of AICTE.

11.16 **Action at the level of MHRD:**

One cannot introduce EHV only at the higher echelons of the educational hierarchy. The entire educational system has to be brought on rails, and EHV needs to be introduced afresh in a big way:

11.17 A National Coordination Committee on EHV should be set up under the chairmanship of the HRM or Secretary (HE)

11.18 National Resource Centres be set up once again in all the subsectors of the educational system

11.19 A dedicated cell should be recreated in the Ministry of HRD to oversee the work relating to EHV.

11.20 **EHV in AICTE:**

The following steps should be taken to introduce EHV in the AICTE:

It is high time that the AICTE makes a firm resolve to evolve suitable models for integrating EHV in the technical education system.

Orientation workshops and faculty development programmes should be organised for EHV.

11.21 **A caveat**

An important caveat has to be entered here. It has been seen time and again that values cannot be taught; they can only be caught. Students follow the example set by the teachers. They do not obey the precepts and principles they enunciate. This fact has to be kept in sharp focus while designing an EHV programme.

11.22 There have been some attempts to introduce values in the curriculum, so that the students are imparted both professional and societal values. But these have achieved only limited success. The students watch their teachers and learn a lot from them, both

consciously and unconsciously. Teaching does not influence them so much as the behaviour of the teachers. Preaching of values impresses the students when they see their teachers actually practising the values in their lives. If they see a contradiction between preaching and practice, they see value education as hypocrisy and learn negatively from them. For example, if the college management charges capitation fees and then preaches honesty, it has a huge negative impact on young, impressionable minds.

11.23 It is, therefore, most important that teachers practise what they preach!

Part III- THE PUSH TOWARDS AUTONOMY

The essence of independence has been to think and act according to standards from within

– Nicholas Tharcher

Chapter 12

Building an autonomous institution

Take the stones people throw at you and use them to build a monument
Ratan Tata

12.1 If there is one incontrovertible lesson to be drawn from the experience of building institutions in a democratic polity like India, it is that no task is more daunting than an attempt to create brick by brick a strong, robust, independent, dynamic, neutral, transparent, just, autonomous institution within the infrastructure of the public sector. There has been a constant struggle to provide as many organisations as possible with the moral backbone and ethical fibre, intellectual probity and capacity to withstand pressures from powerful elements.

12.2 An analysis of the various tactics deployed in this never-ending war reveals the following elements in the organs where the strategy has proved efficacious:

- **A constitutional status:** If a body or post or office or service or cadre is mentioned in the Constitution, it acquires a special status and its working is not lightly trifled with.
- **Appointment and dismissal:** For some selected functionaries, there are special provisions for appointment and removal. For example, a Judge of the Supreme Court can be appointed by the President of India on the basis of a recommendation of a collegium of Judges and once appointed he cannot be dismissed except by impeachment. The Lok Pal can be appointed through a special process by persons of consequence. In the appointment of CVC and Director CBI, the Leader of Opposition has also to be consulted.
- **Long tenure:** For some posts, tenure of six years is prescribed. This gives the person enough time to plan out his strategy and then implement it effectively.
- **No extension:** No extension in tenure can be given. This curbs the element of greed. No other assignment can be offered after superannuation.
- **Charged budget:** The budget of the concerned organisation is charged. It is not voted. So the functionary cannot be squeezed out by denying him finance.
- **Extraordinary powers:** In the case of the Election Commission, extraordinary

powers have been conferred on the organisation. The entire staff of the Government is supposed to be under the administrative control of the Election Commission. Seshan used this provision to lay down the unique proposition that he could suspend and charge sheet those employees.

- **Block grants:** Institutions like the IITs have obtained autonomy by insisting on block grants from the Government. The scheme wise distribution of funds is decided upon by the IITs themselves.
- **Independent governance:** The IITs are governed by the IIT Council, which has inter alia all the Directors of IITs as members.
- **Ownership of the admission test:** The Joint Entrance Examination has been conducted by the IITs themselves or by an independent agency like the CBSE
- **Independent cadre:** The officers employed in the body have to be selected by an organ of itself. Bulk of them should be regular employees and not deputationists.
- **Hands off policy:** The government has to take a policy decision that it would not interfere with the day to day affairs of the Organisation. It is this "hands off" policy that has made the IITs world class institutions.
- **Strict adherence to the Statute:** One of the important factors is the rigid adherence of the administrative ministry to the provisions of the Statute. If a role has been assigned by law to an organisation, it should not be whittled down by constant nit-picking.

12.3 **Analysis of the AICTE from the point of view of autonomy:**

Numerous witnesses have complained to us that the basic malaise of the AICTE is that it is not autonomous. The top leadership is so constantly being pressurised by powerful elements like politicians, bureaucrats, businessmen, educational promoters and entrepreneurs that they are compelled to take decisions that run counter to the law, rules, norms, standards and laid down policy.

12.4 They have again and again urged the Committee to somehow liberate the Council from the stranglehold of the powerful elements in the polity. Accordingly, the Committee have made a special attempt to understand the autonomy issue.

12.5 What we have been able to fathom is that in the case of the AICTE all the rules for autonomy mentioned above have been flouted. Let us recount the points in seriatim:

- AICTE does not enjoy a constitutional status
- The procedure for appointment of the Chairman and other functionaries is the

usual one. The Government can appoint practically anyone it wishes. The top leadership holds office at the pleasure of the Government.

- The top three are appointed for three years and can be given tenure of three years.
- The budgetary provision changes from year to year and is not a charged expenditure.
- The top leadership does not enjoy any extraordinary powers.
- Although the Council is given a block grant, the amount is so petty that the Council has practically no leeway.
- The constitution of the Governing Council and Executive Committee is such that the entire membership consists of persons nominated by the Government.
- There is a plethora of testing agencies which determine the admission policy.
- AICTE has hardly any cadre of technical and professional experts of its own. Bulk of the staff is on deputation from disparate organisations and has hardly any stake in the future of the AICTE.
- The Government intervenes on a daily basis in the affairs of the Council.
- Although the AICTE was intended under the statute to be the apex national agency to promote a coordinated and integrated development of technical education at all levels throughout the country, in practice it was never empowered in this behalf. Government itself exercised the powers of the national agency promoting the coordinated and integrated development of technical education in the country. It created autonomous bodies like the IITs, the NITs, the IIMs, the NITTRs and the like and allotted huge funds to them.

12.6 Thus under the present dispensation, there is no special status for the AICTE. It is one of the several agencies being used by the Central Government to promote technical education in India. It is not the overall coordinating body nor is it the chief of the several organisations.

12.7 **Committee's recommendations:**

Taking all the factors into account, it appears to the Committee that it would not be possible to reverse the course of events. We have to accept the inevitable and move forward from there.

- **Role of the AICTE:** The first decision the Government needs to take is with regard to the role it wishes to assign to the AICTE. It can at best be a front running agent

of change with regard to the institutions that squarely fall within its jurisdiction. These would not include the institutions that have already been granted autonomy by the Government But these should include everyone else, viz. the universities, the deemed universities, the private universities, the technical universities, the Government colleges and the private institutions etc.

- **Amendment of the AICTE Act:** In order to make everyone's life easy, Government should bring forward legislation amending the AICTE Act in order to make the question of jurisdiction absolutely clear and beyond a shadow of doubt. A draft amendment is placed as Annexure-A to our report.

- **Grant of autonomy:** With regard to whatever limited mandate is given to the AICTE, it should enjoy full autonomy on the pattern of the other autonomous bodies reporting to the MHRD.

- **Selection of top leadership:** We have considered the question of how the top leadership should be selected and appointed. We have taken the post of Chairman AICTE as an example and sent an interim report to the Ministry . A copy of the proposal is enclosed as an Annexure to this Chapter. This is to be treated as a sample. Similar R&P Rules may be drafted for the other top positions like the Vice-Chairman and Member Secretary of the AICTE and similar posts in the National Board of Accreditation.

- **Constitutional protection:** It would be a progressive step if there are two provisions in the Constitution of India about technical education. First, on the pattern of elementary education, every citizen of India should have a fundamental right to technical education which imparts a skill to him and is oriented towards employment. This will provide the much needed impetus to the transmission of skills to our youth. Secondly, the AICTE should enjoy constitutional protection of the kind enjoyed by (say) the Election Commission of India. This could include a provision stating that the top leadership can only be removed by impeachment. Any interference in the day-to-day functioning of the AICTE should be made a serious offence punishable under the IPC. The only exception should be the MHRD, who should be authorised to issue directives on broad issues of policy. Draft amendment to the Constitution of India is placed at Appendix A.

- **Allocation of funds:** If a single IIT can be given a munificent block grant of Rs. 300 crores, why should the AICTE with its jurisdiction extending to thousands of institutions get a pittance of Rs 210 crores? We have separately estimated what

amount would be justified for the next ten years. Allocation of funds should henceforth be a charged expenditure, so that it is non-divertible.

12.8 **Building of working relationships with a number of cognate autonomous bodies:**

In order to be an effective player on the scene, AICTE should build up working relationships with existing or proposed autonomous bodies, which shall not be under its administrativecontrol but shall be designed to cooperate with it for the attainment of nationally desirable goals.

12.9 **The AICTE should set up institutions to perform major tasks as under:**

a) A National Testing Agency to conduct examinations for admission to all institutions other than the ones covered by the JEE (Advanced).This will be an autonomous body totally independent of the AICTE. It may continue to patronise existing mechanisms like the CBSE or outsource the work to other agencies.

b) A National rating Agency which conducts the rating of educational institutions through third party rating agencies empanelled by it. This shall also be an independent organisation like the NBA, but the Regulation Wing of the reconstituted AICTE will liaise with it for suggesting the parameters to be taken into account. Both the NBA and the NRA will be umbrella organisations, independently looking after accreditation and rating matters.

c) A National Centre for Futuristic Education under the Mentoring and Development Wing of the reconstituted AICTE to experiment with various brands of ICT-based learning, anticipate new technologies and the technical courses to be launched or modified to meet their requirements etc.

Details of these institutions are provided elsewhere in the Report.

Annexure to Chapter 12

Final Proposal for amendment of Recruitment Rules for Chairman AICTE formulated by the AICTE Review Committee

Introduction:

Currently the appointment to the post of Chairman AICTE is governed by the Recruitment Rules, 2009. Experience shows that there is a huge scope for improvement in the Rules to ensure that most competent persons are appointed to this crucial post. This proposal is the result of detailed discussion in the Review Committee.

The Review Committee is of the definite opinion that the quality of the top leadership counts decisively in the effectiveness of an organisation. The appointment of a well-qualified, intelligent, balanced, dynamic and visionary Chairman is of such critical importance for the revitalization of the AICTE that it outweighs all other considerations.

The Review Committee feels that the devising of a special procedure to select the Chief Executive of the apex body in technical education will underline the importance this government accords to technical education as a prime mover of the country's economic growth, manufacturing prowess and the quality of its technical and managerial manpower. The importance of the Chairman AICTE is in no way lesser than that of assignments like Central Vigilance Commissioner or Director, Central Bureau of Investigation.

Present procedure

The post is a Class A post in the scale of Rs. 80,000.The appointment is to be made by the Central Government by taking a "distinguished or renowned person in the field of technical education" by deputation or short-term contract.

Applications are invited through open advertisement. Applicants should preferably be below the age of sixty years. Appointments are made on a tenure basis for a term of three years, renewable for one more term of three years, or till the age of sixty five years, whichever is earlier.

Selection is made by the Central Government on the basis of a panel of names recommended by a Search-cum-selection committee constituted for this purpose by the Department of Higher Education. The Search-cum-selection committee is constituted as under:

a) A reputed educationist, technologist or scientist as Chairman

b) Secretary, Higher Education, Government of India (Member)

c) Three outside experts who shall be eminent educationists/ technologists/ scientists

not below the rank of Secretary to the Government of India if they are serving officers (Members)

Appointment is approved by the Appointments Committee of the Cabinet. At present, this means that the Department of Higher Education obtains the approval of HRD Minister on its file and forwards the case to the Department of Personnel. That Department processes the case on file and gets the PM's approval. The file is shown to the Home Minister on its return journey.

Proposals for change in the RRs

The present RRs suffer from several inadequacies and need amendment. Some of these amendments are suggested in the following paragraphs.

Qualifications:

The present Recruitment Rules are vague or non-specific in some material particulars. They do not specify the educational qualifications of the incumbent. He should be a "distinguished or eminent person in the field of technical education". The Review committee is of the firm view that the Chairman should be a Ph.D. in Engineering or Management.

Experience: The Rules do not say that the person should have extensive work experience of academia and deep knowledge of industry, nor does it specify the level of positions that he should have held. We may lay down that he should have held high positions in academia. More specifically, he should have had at least three years' experience as Director of an IIT or IIM, or five years' experience as Director of an NIT or ten years' experience as Professor in an IIT or IIM, or three years' experience as Vice Chancellor of a prestigious university or ten years' experience as a Professor in a prestigious university .Persons who have held the positions of Chairman or Vice Chairman UGC or Vice Chairman AICTE should also be considered. Persons who have in addition at least three years' experience as an independent Director in a Public Sector Undertaking or a Private Sector Company shall be given preference.

Age: As far as age is concerned, we should be more forthcoming. Age limits should follow the established patterns already prevalent for Vice Chancellors and other similar academic positions. Persons should be considered till they reach the age of sixty five years. The age of retirement should be seventy years.

Tenure: The appointment should be for a period of five years at one stretch. The snag with a short-term appointment for three years is that the incumbent is not able to formulate an agenda for reform and then implement it. The extension at the end of three years makes him susceptible to pressures and blandishments. A clear tenure of five years makes him fearless and independent.

The Chairman should only enjoy a single tenure of five years. No second term will be permissible, nor should he be given an extension of tenure, whatever might be the circumstances. The better option would be to give acting charge to the Vice- Chairman.

Procedure for application: The Search-cum-selection Committee should call for applications from candidates, but there should also be a provision for nomination by persons notified as eligible nominators and for collecting names through the process of invitation.

Constitution of Search-cum-selection Committee: The Search-cum-selection committee should be constituted as under:

a) A technologist, scientist or educationist of repute at national and international level: (Chairman)

b) Secretary, Higher Education, Government of India

c) Secretary to one of the scientific ministries to Government of India, by rotation

d) Chairman of CII,FICCI, ASSOCHAM or NASSCOM, by rotation

e) CEO of a blue chip company.

Procedure for selection:

The Committee should first screen out the obviously junior, ineligible or unsuitable candidates.

A questionnaire should be sent to those found to be prima facie worthy of consideration. On the basis of the questionnaire, candidates should be asked to make a presentation, analysing what they consider the problems and challenges facing the AICTE. They should be asked to submit a roadmap of the measures they would initiate to galvanise the organisation.

The Committee would spend considerable time in analysing the answers. They should consider the age, qualifications, experience, bio data, reputation, integrity and stature of each candidate. A short list of the ten best candidates could then be prepared.

Persons thus selected would be called for a personal interaction where the Committee would get a fairly accurate idea of the personality, vision, administrative acumen, value system and dynamism of each candidate. The Committee would then draw up a panel of three names strictly in order of merit.

Final Selection: The panel of three names would be considered in a meeting by a special committee consisting of the Prime Minister, HRD Minister, leader of the largest Opposition party in Parliament and Cabinet Secretary. It would normally select the first name on the panel. There should be a consultation leading to a consensus in the selection of a candidate.

Chapter 13

Pursuit of excellence

Excellence is a state of mind
Malavika Sarukkai

13.1 One of the primary objectives of AICTE over the next decade would be to enable significant enhancement of Quality of the technical institutions in our country. The Committee considers Autonomy as the first pre-requisite. However, mere Autonomy is not enough. What is needed is that these autonomous institutions pursue EXCELLENCE in every aspect of their functioning. Mediocrity is the bane of most of our higher educational institutions today and it can only be countered with a single-minded focus on Excellence.

13.2 "Excellence is a state of mind". It is never complacent and never satisfied with the present; it keeps pushing boundaries all the time, to achieve what was traditionally considered impossible. The phrase "It cannot be done" disappears from the dictionary. Such a mindset requires an eco-system where excellence is respected and honored and mediocrity despised and rejected. Once one is ready to tolerate a mediocre performance, very soon everything gets reduced to mediocrity. Meritocracy is forgotten. Higher achievement is not rewarded; the mediocre becomes acceptable.

13.3 Excellence does not have a single dimension. Different people could excel in different ways. While a new scientific discovery or a major technological development is one kind of pursuit of excellence, taking low-performing students and getting them to perform at a significantly higher level is another. While all technical institutions need to pursue excellence, their pursuit need not be the same. Some could be very high quality R&D institutes, others could be high quality undergraduate teaching institutions. It would be a mistake to consider one to be superior to the other. To repeat what was stated above and emphasize the importance of understanding this basic point about excellence, an institution which gets below average students as the input and graduates them to be significantly above average is pursuing excellence no less than an institute which takes in the best students as input and graduates the best. Both are equally important tasks.

13.4 An excellent institution is never satisfied with itself. It constantly looksat its weaknesses and strives to do even better. This requires the faculty and management to be of excellent

quality. No compromise must be acceptable in this. If one does not have enough excellent quality teachers available, means need to be found to develop them and get them, rather than taking lower quality personnel as faculty in order to just fill vacancies. This report will therefore suggest mechanisms to develop high quality faculty by taking the best undergraduate students and getting them to do their PhD and training them, rather than taking the best from the available lower-quality graduates or PhD students. Short-term compromise with quality moves the whole system towards mediocrity. It has to be realized that those who are recruited today as young faculty, are likely to stay as faculty for over 40 years. Any compromise with quality today, therefore, makes the institutions and the educational system suffer for decades.

13.5 The problem with lower quality management is even more acute. If the management is poorly endowed and motivated, the whole institution slides into mediocrity. Pursuit of Excellence requires a management which never compromiseson issues of meritocracy. The same can be said about Board of Governors. The Board of Governors and management play an even more important role than the faculty. If they have a *"chalta hai"* attitude, one can bid goodbye to excellence.

Constraints and but what can we do!

13.6 An institution is bound to face a number of constraints in pursuing its goals. What the leaders do with these constraints determines the fate of the organization. If they give up easily, saying "but what can we do", the battle is lost even before it has begun. if they cannot do anything, who else will! It is the leadership which has to find the answers. Giving up and accepting mediocrity in the face of constraints becomes the starting point of bigger problems. The institution starts slipping. Soon the slip extends to other areas, even where the constraints did not exist.

13.7 The answers to constraints often lie in coming up with out-of-box solutions rather than accepting the old ways of doing things. Driving change is the master key to overcoming of difficult situations. Assumptions need to be challenged if we have to find new answers. An example[1] of constraint could be to find the right balance between affordability of technical education and provision of quality education; if the resources are not enough for an undergraduate institution to pursue quality and higher fees become unaffordable to a large number of students, one has to find new answers. While

[1] These are not a recommendations of the committee. They are only examples of out of box thinking to overcome constraints.

seeking government support could be one answer, relooking at the norms used traditionally could be another. There is no reason why something new[2] cannot be tried.

13.8 An example is the way we have defined space required per student to pursue the undergraduate technical program. As real-estate (and rentals) within cities become expensive, for large space requirements the institutions move out. This involves a tremendous wastage of timeas studentscommute back and forth every day, seriously adding to congestion, pollution and use of oil / gas. This is because we think that only residential institutions could be excellent. While this may be to some extent true for post-graduate studies, it need not be so for undergraduate studies. One could[3] have class-rooms and shared labs with two to three shifts of usage and twelve months' usage to handle a larger number of students in the middle of the city. The high real-estate costs would get divided over a greater number of students. It would thus be possible to have institutions within cities. There is no reason why with proper design, excellence or quality of instruction would be compromised. It isjust a question of thinking differently.

13.9 To generalize, one could say that excellence is all about thinking differently to achieve what is ordinarily not possible. It is this that the institutions need to pursue and it is this that they need to inculcate in their students, so that they could pursue excellence wherever they go.

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2 For example, teachers have traditionally taught about 8 months (two semesters) and get the rest of the time off. While some teachers do pursue enhancement of knowledge, research or interact with industry, others just while away the time. Teachers could just get 30 days off (just like employees of other industry), and could teach eleven months in a year. Infrastructure would also be better utilized. While the costs would reduce making the education more affordable, it could also enable enhancement of salaries for faculty; in fact different faculty could opt for either two or three semesters and get different emoluments accordingly.

3 Sport facilities within the city could be used by students just like that used by other citizens.

Chapter 14

Combating commercialization

Vidya Dhanam Sarva Dhanam Pradayam
Ancient Saying

14.1 Introduction:

To sell education was considered to be a sin in India. In Gurukuls[1], till the beginning of the eighteenth century, and in universities in India, till the thirteenth century, not only was a student not charged any fee, all costs of his stay and education were borne by the institution. Once the Acharya[2] found an applicant to be worth admission, all expenses on his education were the responsibility of the Gurukul.

Nearly the same system prevails in the developed world for doctoral work. Usually if a student is accepted for doctoral studies, the candidate is supported fully. Probably the developed world believes that doctoral research work is of value to the society and has to be supported fully so as to attract meritorious students.

It may, therefore, be argued that traditionally in India, education of the young was considered to be of value to the society.

The higher education system, after the first three Universities were established during 1857, required every student to pay tuition fee for his/ her education. However the government used to provide grants to all the institutions of higher education. Hence the tuition fees were low. The government was also providing some scholarships to meritorious students. Thus education would not be very costly. A new institution could be established only when the government agreed to give the necessary grants. Since the government was allocating no more than about 2% of GDP to education, it could not sanction adequate number of grant in-aid institutions. Hence a grave shortage of seats arose. The shortage was particularly acute in technical education,

[1] A Gurukul" was an institution of Higher Learning

[2] 'Acharya' was the Chief of the Gurukul or the University

since a technical institution is costly as it requires investments for establishing laboratories and workshops, in addition to the requirements of class-rooms, seminar rooms and libraries.

To alleviate the shortage, the government instituted the policy of permitting self-financed institutions of higher education. These institutions are given no financial help by the government and are, therefore, nearly free from governmental control in their day-to-day operations. The only financial resource for such institutions is the fees, which they receive from their students. A large number of such institutions have been started; several of these are by persons, who are more interested in generating surplus and siphon it off rather than offering high quality education. When the focus of the management is to indulge in such practices, the institutions are said to commercialise education.

14.2 **Starting with Care:**

The Greenfield ratings, recommended in this report, should, therefore, put special emphasis on verifying the promotors' credentials. It should also carefully assess the Governing Council to ensure that it is not a single person/ family's fiefdom.

Besides other norms of inputs, the reputation of the promotors as persons, who can work so that public interest is given a priority over private benefits, should be considered.

14.3 **Developing a mechanism of encouragement for investing in quality education, along with openness:**

Every SFI will be encouraged to invest in quality education so that the institution could get a higher rating.

OPENNESS: Every College would be asked to put on its web-site the rationale for whatever fee was being charged. This may be the policy and detailed information about how the Fee Regulatory Committee determined the fee. Or after it has gained autonomy, how the institution has set its fee structure.

Secondly every College would be required to present on the web its monthly salary expenses[3] . The accounts should also show the names of the Faculty Members, HODs

[3] An example of large social enterprise, which has been putting daily receipts and expenses on the web, is the Blind Men's Association, Ahmedabad. The NGO is well respected for its transparency and is now managing institutions for the handicapped all over Gujarat.

and the Principal along with the payment made to them every month. If the policy and the actual expenses show a persistent divergence, a College must have reasonable explanation; else the rating should plummet to the lowest level.

14.4 **Persisting Low ratings for two years:**

If a college gets poor ratings and it does not substantially improve inspite of warning, the report recommends that AICTE would need to move to take over and merge the institution with another good college. In case there is no other institution in the nearby area, the technical University in the locality may be asked to temporarily take over the College and manage it directly.

14.5 **Conclusion:**

The recommendations in this report on creating autonomous institutions along with setting up of rating agencies and enabling provisions for legally taking swift action on merger, if the ratings should fall twice in a row, form an integral whole.

If only the provisions for autonomy are accepted and if it is not possible to forcibly merge the institution with another good institution or in case of delay due to any reason, the universities to which they are affiliated should carry out the take-over.

Hence if the recommendation for greater autonomy are accepted, these must be accompanied with setting up of rating agencies and with the provisions, recommended in 14.2, 14.3 and 14.4. Otherwise the result will be uninhibited commercialization, which may ruin whatever good quality may be existing in some corners of the large system today.

Chapter 15

A model autonomous institution

Children must be taught how to think, not what to think
— *Margaret Mead*

15.1 Here we suggest some elements of a model institution. In any specific instance many things will depend on the physical location of the institution, availability of human resource, etc. Nevertheless, the elements of a model institution could form the core. The elements given below are for a model institution with a strong focus on undergraduate engineering education. A similar exercise can be carried out for other disciplines.

a. A Greenfield institution should be deemed to be autonomous or autonomous right from the beginning. Time has come, not to start any new affiliated institutions.

b. In order to facilitate dynamism in academia, mobility and credit transfer, flexibility, experiential learning, entrepreneurship, and the various other ideas discussed above, the governance structure too must be dynamic and flexible. It is not appropriate for us or anyone else to suggest a detailed governance structure – this of course will have to be developed by the autonomous institutions. What is attempted here is a very broad contour of the governance structure.

c. In an autonomous institution, there will be a Governing Council, which will be the apex body. The Council will be highly empowered and will have to be chosen very carefully. The council along with the Vice-Chancellor / Director will play a key role in setting the path to excellence for the institute. Thus selection of the members of the governing council members is of utmost important. It should consist of:

   i. Eminent academicians and researchers who have had significant experience in teaching and research at leading academic institutions or research organizations in the country (member of national engineering and / or science academies or they are recipients of national prestigious awards like Swarna Jayanti, Bhatnagar, etc.).

ii. Industry leaders who have had a proven record of leading and building enterprises in the country

iii. If possible, at least one or possibly two members from world renowned institutions from overseas. They should try to pick those faculty who are members of the country's national academy of engineering or sciences.

iv. Leading alumni of the institution who have proven themselves in academics and / or industry.

v. Two members of the Institute's Academic Council.

vi. The Council should not have any representation from promoters or at best only one seat for the promoter's nominee.

vii. The Chairman of the Council will not be nominee of the promoter or the promoter himself.

viii. There should be no political representation on the Council.

d. It is the Governing Council which will appoint the Director / Vice Chancellor / Principal of the institute and it is the council members who should play a major role in selecting VC / Director. The Director / VC / Principal will, in turn, through a proper selection process, recommend names to the Council for appointment as institute faculty and functionaries. It is in consultation with Council that an organizational structure will be evolved for the institute.

e. Academic Council: The institute should have an academic council consisting of faculty and three student representatives. The academic council should have an eclectic mix of Professors, Associate professors, and Assistant Professor. In the beginning the institute would not have many or no Full Professors and therefore it is important that Associate and Assistant Professors be given a voice in the Academic Council. Moreover, Assistant and Associate Professors are the torch bearers of the future of the institute and thus they should have a representation on the Academic Council. The student representatives will provide the student perspective and make available inputs from the students. The Governing Council will not interfere with the academic matters and can only make suggestions to the academic council. The Academic Council will have the sole authority with regards to the academics in the institute. It will decide the academic curriculum, academic programs etc. of the institute.

f. Though, the Academic Council will be looking at the overall academic programs and curriculum of the institute, the individual departments will be empowered to

introduce new courses, new laboratories, modular courses, and innovate on the academic program in their individual departments. The idea being that just as the institute is empowered, the individual departments are also empowered and they don't have to go to the Academic Council for all approvals. As long as they innovate within their budget, they need not require approvals.

g. The job of the Governing Council, Academic Council and the Faculty must be to ensure the pursuit of excellence and inculcate the culture of passion and pride among the institute fraternity.

h. As mentioned earlier, quality assurance in the institution will depend on the ratings and accreditation. Quality assurance has to be the backbone of the institute.

i. Another element to be incorporated is a review of the institution, every 5 years, by an external committee of highly eminent academicians and industry people only. Typically a committee of 5 is recommended; moreover the committee should not have members from the city or the state in which the institution is located nor from the promoters – and this review time be staggered with respect to accreditation. The main objective of the review is to look at academic innovations, and if need be overhaul the academic program every five years. This will be friendly review, the review will not be a critique but a proactive approach in the pursuit of excellence.

j. If possible, create a consortium of say 10 similar institution (similar in size and programs). The VC / Director of these 10 institutions will meet at least once, if possible twice, a year to exchange ideas on academics, various programs and how to become institutes of excellence.

k. The leadership team will consist of VC / Director, Deans and Heads of Departments. Dean and HoDs will be selected based on merit and not on seniority. The position of Deans, HoDs will be held for a fixed term and none will be eligible to hold the position for more than two terms. The institute should pursue a policy of meritocracy.

l. Academic Program to be student centric and broadly have:

   i. Learning by doing: Lots of projects in all courses

   ii. Have a course structure for all students in Creative Design

   iii. Science based engineering program

   iv. Developing soft skills by asking students to write white papers and make

presentations on these not just listen to lecture on soft skills. Once again learning by doing.

v. Have industry exposure by having short modules being taught by industry personnel and if possible short visits to industry.

vi. Have a flexible / fractal and movable credit system

vii. Have an entrepreneurship module or a program

m. Autonomy of the department: Same way that the institute has autonomy, various departments in the institute should also have autonomy. They should have the autonomy for

i. Faculty selection shortlisting.

ii. External Selection Committee to finally recommend to the Governing council for faculty offering.

iii. Course curriculum, setting of papers, Evaluation of papers, assigning of grades, in short academic autonomy.

n. The institute should have a flat culture, it should not create hierarchies. It should be keep in mind that a faculty today, will be a functionary tomorrow and faculty the day after. What is invariant is being a faculty and that should enable a non-hierarchical culture.

o. Should have good sports facility, good facilities for cultural events and a student entrepreneurship cell.

p. If possible hostels for about 30% to 50% of students

q. Admission based on national exam approved by AICTE's National Testing Agency – possibly JEE Main.

r. If possible, have a mentor institution (IIT, IISc, IIIT, ISER)

s. Flexible fee structure: Market driven fee structure. Students from weaker segments to be provided scholarships and / or loans.

15.2 Financial model

Financial Model: This will depend on multiple parameters of an institute. A total cost structure (per student) is computed here, with the assumptions (for a purely undergraduate institute) given below. The cost per student is worked out for two cases

a. Capacity: 5000 students in five to seven years

b. Faculty to student Ratio: 1:25 or 1:20

c. Average faculty salary: ₹8.5 lakhs per year

d. Space required per student: 50 sq ft or 75 sq ft

e. Cost of building infrastructure: ₹2000 per sq ft

f. Faculty salary being 60% of total operational cost of the institute

g. Depreciation over 12.5 years and interest cost of 12%.

	Case 1	Case 2
Number of students per faculty	25	20
average faculty salary /year (lakhs)	8.5	8.5
space required per student (sqft)	50	75
infra cost / sqft (₹)	2000	2000
faculty salary as % of operation cost	60	60
depreciation %	8	8
interest rate %	12	12
operation cost per student per yr (₹000)	57	71
Dep. & interest cost per student (₹000)	20	30
total cost per student per year (₹000)	77	101

15.3 As mentioned earlier, the chapter gives the elements of a model UG institution. Lot more details will have to be incorporated, but without compromising the fundamentals of autonomy and operations described in this chapter.

Part IV- QUALITY ASSURANCE

People forget how fast you did a job,
but they remember how well you did it

-Howard Newton

Chapter 16

Estimating quality

Quality means doing it right when no one is looking
Henry Ford

16.1 The approach of the Committee's recommendations is to have light-touch regulations for Technical Educational Institutes, avoiding frequent and regular applications and approvals. The approach is to let an institute flourish and grow with minimal restrictions and controls, as long as the institute is doing well in terms of providing quality education; in fact, the recommended approach is to focus on helping such an institute do better. If, on the other hand, the institute is faring poorly on quality, the institute is supposed to be warned and in case of no improvement even after warning, merged with better running institute (or even closed down in extreme cases). A critical requirement of this approach is to estimate quality fairly accurately on a continuous basis, so that one can figure out the pace at which the institute is moving in the direction of improving quality. .

16.2 The Committee considers accreditation and rating as the chief vehicles of estimating quality of a Technical Educational Institute. Both these vehicles are to be compulsorily used by all technical Institutes and the results are to be the basis of all regulations. They will both be discussed in detail. However it must be pointed out that the Committee considers rating as the fulcrum of continuous quality assessment. On the other hand Accreditation measures milestones to be achieved by the institutions.

16.3 The Committee recommends that the role of AICTE in estimating quality will be two-fold:

i. AICTE will set up an independent National rating Agency to empanel third party rating Agencies. Accreditation will be carried out by the similarly autonomous National Board of Accreditation which shall act as the umbrella organisation to empanel the accreditation agencies.

ii. In Chapter 34, we have outlined the manner in which the AICTE would be restructured in order to perform its new mandate. Although the main accent will be on mentoring and development which will have a full-fledged Wing with four constituent Divisions, the regulatory part of its work will still continue in the Regulation Wing consisting of one Division.

16.4 The Regulation Wing shall continuously monitor the performance of each institution both with respect to rating and accreditation. All decisions will be based on the performance. AICTE will set up a Committee of Experts in its Regulation Wing to:

i) suggest (not decide) parameters to be used for Accreditation and rating.

ii) decide on regulations based on the quality-estimates.

iii) determine the policy regarding extent and kind of support that an institute would be eligible for based on quality-estimates.

We now discuss in detail the accreditation and rating in subsequent to chapters.

Chapter 17

Accreditation

Quality can't be spotted by an algorithm
Kristina Halverson

17.1 Accreditation is a process by which educational institutions or its programmes are reviewed and rated by an agency with respect to specific standards of quality. If the institute/programme meets the standards, the agency grants the accreditation. For example, currently in India, agencies like NBA and NAAC have provided accreditation to institutes and programmes.

17.2 All the world over, the main instruments for monitoring the quality of educational institutions and of their educational programmes are accreditation and ratings. They can be used in complementary ways to ensure that the quality of academics is ensured (types and content of courses, quality of faculty and of education delivery, modern laboratories etc.) and the quality of the educational institutions are not just maintained at adequate levels but are improving continuously. This provides confidence and assurance on quality to various stakeholders, including students.

17.3 The process of accreditation brings benefits to all stakeholders in education:

- It helps institutions become aware of their strengths, weaknesses and opportunities
- It helps institutions to be better organised and futuristic
- It initiates innovative and modern methods of pedagogy at institutions and gives them a new direction and identity
- It provides society with reliable information on quality of education offered
- It promotes intra and inter-Institutional interactions and enhances mobility of students besides improving employability
- It contributes to social and economic development of the country by producing high quality technical manpower.

17.4 It also helps prepare institutions for international accreditation. Accreditation of educational Institutions/programmes is a global practice and its need has been felt by various developing and developed countries for one or more of the following purposes:

- Funding decisions
- State recognition of qualification/ certification of professionals
- Accountability of Institutions to stakeholders
- Encouraging self-improvement initiatives by Institutions
- Quality assurance and quality enhancement of educational programmes.

17.5 The National Bureau of Accreditation (NBA), an autonomous body created by AICTE in 1994, accredits programmes in technical education at the diploma, undergraduate (UG) and postgraduate (PG) levels. The subject areas covered include all the areas under the jurisdiction of the AICTE namely:

- Engineering and Technology
- Management
- Pharmacy
- Architecture
- Applied Arts and Crafts
- Computer Application
- Hospitality and Tourism Management

17.6 In the past NBA accredited educational institutions and departments. However as of 2010 the NBA accredits only educational programmes, not institutions or departments.

17.7 Till recently, NBA's process was based on estimating inputs that went into the educational program. However, NBA has now reformed its processes and made it much stronger. The process of accreditation is now outcome based. This process focuses on the predefined outcomes that by and large, signify knowledge, skills and capabilities expected from a graduate on successful completion of a program and also on the continuous improvement in attainment of outcomes vis-à-vis predefined outcomes and their relevance to Mission and Vision of the institution and Educational Objectives of the programme. The process starts with training the teachers and management of an institute to carry out outcome based self-assessment.

17.8 In order to accommodate the diversity in the quality of educational institutions in India, NBA follows a two-tiered system of accreditation. The TIER-I system has been designed for the technical programmes offered by autonomous institutions and high quality university departments, while the TIER-II system is fine-tuned for the needs of the non-autonomous institutions affiliated to a university. In both TIER-I and TIER-II systems, the same set of criteria have been considered for accreditation. However, the relative weightage of outcome based criteria is higher in the TIER-I system. A non-autonomous institution may also apply for accreditation on the basis of TIER-I system, provided their curriculum is capable of attaining the desired outcomes of a programme.

17.9 The different stages of the accreditation process are described in detail diagrammatically at the website of the NBA, including the processes for appeals when required. The process of accreditation begins with the college applying for accreditation. It submits a self-assessment report as part of initial interactions. NBA constitutes an evaluation committee that makes a visit and provides a report. It is therefore not surprising that whenever the quality of the members of the committee that visits is weak, the accreditation itself is weak.

17.10 Another accrediting body, the National Assessment and Accreditation Council (NAAC), accredits institutions of higher education in India. NAAC is an autonomous body established by the UGC in 1994 that accredits only those institutions that choose to be accredited. All universities, institutes of national importance, and colleges (affiliated, constituent or autonomous), including colleges providing technical education, are eligible to be accredited. The following seven criteria serve as the basis for assessment:

- Curricular Aspects
- Teaching-Learning and Evaluation
- Research, Consultancy and Extension
- Infrastructure and Learning Resources
- Student Support and Progression
- Governance, Leadership and Management
- Innovations and Best Practices.

17.11 As with the NBA, the process of assessment involves the institution submitting a self-study report following which NAAC sets up an evaluation committee to visit the

institute. The accreditation status once granted is valid for a period of five years. The quality of members on the committee therefore reflects on the strength or weakness of the accreditation process. Since accreditation of institutions is not yet mandatory, only a fraction of them have chosen to be accredited so far.

17.12 **Review Committee Recommendations**

The Committee notes that the accreditation process is an important detailed (micro-level) academic audit exercise which indicates that an educational institution has crossed a certain mile-stone. It therefore recommends that all technical institutions under AICTE must get comprehensive periodic accreditation, both an institutional as well as program accreditation. Noting that whenever the quality of the members of the committee that visits is weak, the accreditation itself is weak, it recommends that the accreditation committee should involve proven IIT / IIM faculty, eminent academicians and industry persons, and some alumni of technical institutions. The quality of the committee should never be compromised. A record should be kept of who was involved in which accreditation committee and a periodic analysis (using data-mining) of their performance should be carried out. Those who are found to be weak should not be involved in accreditation process in the future. It is recommended that these records should be shared by all accreditation and regulatory organisations, similar to what CIBIL does for financial borrowings of individuals and organisations. The committee also notes that accreditation is a somewhat long and slow process and does not adequately measure quality levels dynamically.

17.13 The Committee recommends that NBA should be fully autonomous umbrella organisation to carry out accreditation of not only programs, but also institutional accreditation for all technical educational institutes, including the institutes affiliated to universities. The technical programs that universities offer should similarly be accredited. The committee recommends that NBA should identify and empanel multiple agencies (international agencies like ABET may be invited) to carry out accreditation of all the institutes. NBA should set the Guidelines for accreditation and oversee the accreditation process so as to ensure quality. It is expected that all technical educational institutes under AICTE must get accredited over a time.

17.14 The performance of NBA should be reviewed periodically (say once in three years) by an expert committee set up by MHRD. The review should attempt to figure out the soundness of the accreditation work being carried out by relating the accreditation of institutions with their performance (rating could be one of the alternate measures of

the performance). The report should be placed in the public domain. The committee notes that the role of the AICTE in accreditation process is to be limited to suggestions it could make to NBA for parameters to be used for accreditation.

17.15 The Committee recommends that Accreditation of technical institutions and programs should be the exclusive domain of NBA and NAAC should not be burdened with this task.

Chapter 18

rating as a fulcrum for estimating quality

Education without inspiration is only a recipe for desperation
Ernest Yeboah

18.1 Countries like USA have a sound accreditation system, which every institute goes through. In addition, they have university and Technical Education rankings, being carried out by multiple agencies every year. The ranking system is dynamic and determines how well the institute has been doing with respect to quality in recent times. Institutes vie with each other to attain top positions. The ranking is widely used by students who seek admissions to these colleges and often used by academia, who decide to pursue their career with such institutions. Sometimes, even industry and the government use these rankings to approach an institute when they have a technical problem to solve. Similar ranking systems exist in different countries. The ranking system, however, uses parameters suited to an educational institute in their country, considering the state of development of the country and its industries.

18.2 Over the last few years, some Indian organisations (especially in the media) have borrowed ranking methodology from the West and have tried to carry out such ranking for Indian technical and non-technical institutions. They are severely hampered by multiple factors. First of all they are not truly independent and are known to have had some biases (as they seek advertisements from the institutes they rank). Secondly, they have done little to evolve parameters as per the requirement of Indian educational system. Besides they suffer from an inability to get information about all the institutions, as some would participate vigorously in such rankings, others just ignore them. Finally, the task of relative gradingof two institutions of similar quality requires huge capabilities and data, which they do not have.

18.3 The Committee **recommends introduction of rating** (rather than ranking) of technical educational Institutions in India as a Macro-level Measure and Continuous Estimation of Quality. rating should be carried out by agencies empanelled by AICTE towards this. rating could take into account internal evaluation, but should primarily consist of external evaluation of all processes and systems that are related to institutional academics and administration. Regular evaluation of the institutes by Third Party rating is key to measure quality and therefore to quality sustenance and quality enhancement.

18.4 The rating agencies would, therefore,use factual material submitted each year by institutions to AICTE/ rating agencies that they engage *plus comprehensive in-person and on-line survey of students, alumni, industry and teachers by the agency*. All **Technical Educational Institutions must get compulsorily rated every year** by one of the empanelled rating agencies. They need to pay the rating agency for the rating service.

18.5 In order to be recognized as quality centres of education both nationally and globally, all technical institutions must subject themselves to a process of continuous evaluation and gradation. rating can be a good move towards creating a uniform standard, especially since there is a wide disparity of quality among institutions across the country. The process of rating will ultimately benefit the students who can make an informed choice based on a better idea of the capabilities of the institutes.

Empanelling and Guidance

18.6 AICTE will set up an autonomous body called the National rating gency in order to provide a coherent approach to the entire process of rating. The Agency will function through **anempowered committee** to define the process of empanelling rating agencies specialised for the task and to actually empanel the agencies. Similar rating agencies have indeed been set-up for rating financial status of an industry and financial instruments in India. Agencies such as CRISIL (Credit rating Information Services of India), ICRA (formerly Investment information and Credit rating Agency of India Limited) and CARE (Credit Analysis and Research Ltd), have track-record for about twenty five years and have a credible history of assessment (of having done a fine job and known to be capable and honest), rating and independent review of industry; they havebeen carrying out this task under the overall guidance of SEBI. There has not been any known blemish. Organisations like these and others like the Quality Control Associationof India, industry associations such as FICCI, CII, ASSOCHAM, NASSCOM and so on could be invited to come up with a plan to carry out comprehensive rating in the context of technical institutions. ratings should be tuned to the Indian educational system and its imperatives and should not borrow whole-sale from the rating or ranking processes used outside the country[1] .

18.7 The second role of this AICTE / NRA empowered committee will be to guide rating agencies and suggest processes and parameters for rating. The emphasis here is on guidance and suggestions, rather than recommendations of the process and parameters. Each rating agency will decide its way of conducting the rating and will be responsible for the outcome. The empanelled agencies are expected to keep improving

[1] For financial ratings, the differences between West and India were less, and the agencies have borrowed heavily from the best international practices.

their rating Process and should carry out post-facto evaluation of their earlier ratings to learn and improve the process.

18.8 The AICTE/ NRA empowered committee for empanelment of rating agencies will have reputed and renowned professors from IITs, IISc and IIMs and some eminent academicians[2] and industry persons as well as some alumni of the technical Institutions. There will be no representative from AICTE on this committee . The Regulation Wing of the AICTE shall keep a watchful eye through the autonomous National rating Agency.

rating process

18.9 rating will use factual material submitted each year by institutions to AICTE/ rating agencies that they engage plus comprehensive in-person and on-line survey of students, alumni, industry and teachers by the agency. It would be a measure of the Quality of Governance Structures and the judgement of rating Agency on financial matters, transparency and quality of education pertaining to the institute. It would also measure the extent to which the institution is connected to national networks, and how much the teachers and students have access to online materials.

18.10 Several parameters are to be used for rating and it will be the task of the committee to suggest parameters. However, to elaborate the concept, some of the parameters that may be used are discussed below. The possible parameters are further elaborated in the Annexure at the end of the chapter.

18.11 The quality of the faculty at an institute would play a role in rating. To understand this, one could start with the faculty's performance level (rank in their respective classes) in their UG program. The post-graduate qualification as well as their achievements could also contribute. Similarly the extent to which faculty of an institute are able to file patents and obtain sponsored research funds could count towards the rating. This, however, will not apply in case of domains other than Engineering /Technology under the preview of AICTE. Other factors that may be included are faculty's industry exposure, communication and pedagogy skills. Chapter 22 (Part V) of this report suggests various measures that AICTE could use to support the institute in strengthening faculty. The rating could use some of the parameters suggested there.

18.12 The performance of students in an institute as measured by the number of students

[2] The members of the committee should be members of at least one national academy (INAE, INSA, NAS and IAS) or winner of one of the prestigious awards in the fields of science and technology. One could include similar national academies for management. As also members of apex institutions or winner of prestigious awards in otherspecialisations falling in the jurisdiction of AICTE such as pharmacy, catering technology etc.

taking GATE (for engineering and some similar exit exams for other disciplines) and their performance in the exam, extent of participation and their performance in Direct to Student (D2S) program being offered by QEEE and MOOCS program would contribute to the rating. Some of these courses use interactive material and extent to which students of an institute use this material can be captured electronically; they would contribute to the rating (as discussed in Chapter 21, part V). Similarly, soft skills and communication skills acquired by students, emotional behaviour to assess their maturity for employability and the quality of extra-curricular instructions could be a measure. So could be the performance of the institute in Campus Placement.

18.13 An important measure of rating will be the quality of Governing Board and Governance.The rating should be such that it highly discourages multiple members from the same family on an institute's Governing Board. Accounting practice used by an institute should play a major role in determining the rating. Poor accounting practice and governance should result in drastic fall of rating.

Concept of Graded Autonomy

18.14 Before we discuss what could be done with rating, let us discuss the concept of Graded Autonomy. The objective of Graded Autonomy of an academic institution is to progressively make it totally autonomous, as its quality improves. At the first step, there will be some degree of Academic Autonomy, where an affiliated institute may be allowed to develop its own curriculum, the methods of teaching and carry out examination and grading of the students independent of affiliating university, in some select non-core courses. This would progressively increase to a level where all non-core courses are taught and examined independently by the institution. At the next level this would be extended to core-courses, till complete academic autonomy is exercised. Next the institute will attainadministrative autonomy, as the affiliated university withdraws from insisting on and supervising decisions regarding nature of infrastructure, the level of teacher-hire and teaching and staff duty. At the next level is financial autonomy, where setting up of fees and all financial decisions are completely within the purview of the Governing Board of an institution. Ultimately an institution gets degree-granting rights and becomes completely de-affiliated from the university.

What will be done with rating?

18.15 Every educational institution will be required to display its current ratings (as well as that of that of the past three years) openly in various public places. The rating will be the cornerstone of regulation. Institutions will earn Graded autonomy based on the ratings that they receive and the improvement in their ratings year after year. Rapid improvement in rating will earn them higher autonomy. On the other hand, a fall in

rating will result in warnings and reduction of autonomy. If the rating falls below a certain level, the institute will be warned and required to improve its rating the next year. Failure to improve its rating inspite of the warning would trigger a take-over of institution as well as all the assets of trust running the institution; however, the liabilities will remain with the original trust and its trustees. The institute and its assets will be merged with another trust / educational institution, which is performing well. As this may require certain changes in various acts and law, thesemust be carried out.

18.16 As discussed earlier, the committee recommends that AICTE move away from control and regulation (have light-regulation) of Higher Educational Institutes and concentrate more on its support, facilitating and enabling role. ratings will also be used to determine the extent to which the support will be provided. Higher the rating; more support an institution will qualify for from AICTE / MHRD / Central Government Agencies. It is to be noted that the extent of support will not be determined solely on the absolute value of rating, but also on the pace at which the improvement in rating is taking place.

18.17 As mentioned earlier the committee recommends that a certain value of rating plus institutional accreditation will be required for an institute to become completely autonomous, where it will be able to grant degrees. Similarly a minimal rating plus accreditation would be required for an institution to run any graduate course (Masters or PhD). An existing institution will be given some time to get a minimal rating and accreditation to continue its graduate program. Failing this, it wil have to terminate its graduate program.

18.18 The Committee **recommends setting up of an expert committee** chaired by AICTE Chairman and consisting of members of Academia and Industry to define details of rating based Action. The committee will also work out the processes and procedures to be followed in this regard.

Greenfield rating

18.19 When a new institute is to be set up, the institute has to get itself "Greenfield Rated" from one of the empanelled rating agencies. The project plan for the institute will be evaluated in detail. This will involve evaluation of Promoters, proposed Board members, infrastructure plans, faculty already hired and plans to hire faculty. The people proposed to be involved in Governance of this new institute will be evaluated based on their past performance and reputation. The Greenfield rating will also give weightage to density of existing institutions in the state/region, where this institute is proposed to be established. The objective will be to discourage new institutions in the state/region, where there is already a high-density of reasonably good institutions, whereas establishment of institutions in area where the density is low, will be

encouraged. The proposed institute should get acertain(reasonably high) Greenfield rating to start an institution.

18.20 The Committee recognises that to attain high quality, an institute needs to be fully autonomous. It, therefore, **recommends** that in future only autonomous institutions (and not institutions affiliated with a university) will be started. This would require that proposed new institutes should have a strong and robust plan to attain quality quickly and should therefore get a certain Greenfield rating. If they get such a rating, they would be allowed to start as a "deemed autonomous institute," as permitted by AICTE. The institute would then have to get accredited within a pre-defined time-frame; if it does so, it would get an autonomous Higher Educational Institute by AICTE. In case it fails to get that minimum grade, the institute would have to be either merged with another institute, which is autonomous or, in extreme cases, may even be closed down.

Regulations based on ratings

18.21 The Committee recommends that AICTE should enable all the existing technical institutions to become fully autonomous within the next decade. As mentioned earlier, new institutes are to be started only if Greenfield rating is such that the institute could start as an autonomous institute. Initially, it will be provided a "deemed to be autonomous institute" status and in some time, when regular rating as well as accreditation confirms the quality level, AICTE will give it a fully autonomous Higher Technical Educational Institute Status. The Committee recommends that appropriate law has to be in place for this to happen.

18.22 The existing institutes will be informed that they need to progressively get higher grades of autonomy in the coming years, by obtaining ratings required for that level; ultimately, within ten years, they have to acquire fully autonomous status as affiliation to universities will come to an end. Some of the institutes may choose to merge with each other and acquire certain size as they move towards autonomy. The Committee notes that most of these fully autonomous institutes should move towards a size of about 5,000 students, though excellent smaller autonomous institutes specialising in niche areas may continue to flourish.

The existing Higher Technical Educational Institutes, which fail to rise up to the challenge and obtain the minimal grading and institutional accreditation required for full autonomy within ten years, should merge with better institutes. If they do not do so, AICTE will have power to take over the institute and all its properties (without existing liabilities) and merge it with another institute, with higher rating. The Committee recommends that a law be enacted to give AICTEthe power to be able to do this.

Annexure to Chapter 18

Some Suggestions regarding process and parameters to be used for rating

18A.1 Criteria for rating could include measures like quality of faculty (education and levels of training, research etc.), completeness of curriculum, institution pass percentage, institute drop out counts, number of seats vacant, adequacy of facilities, extra-curricular activities, technical contests and project quality, student faculty ratio, presence of an alumni association, placement records, employability of students, employer references, fees, students and faculty feedbacks, transparency, and parents/guardian satisfaction. But far more important is extensive third party polling (both using electronic media as well as in-person polling). Students (present and past), faculty, industry should be polled to get regular feedback about the institute.

18A.2 The brief measures that can be considered towards implementing third party rating will include:

i. Inputs from the institute on verticals such as academics, administrative processes, infrastructure, teacher-student ratio, placement-record and so on.

ii. Survey and interviews with stakeholders such as students, faculty, parents, alumni and employers

iii. Online monitoring of institute based on participation in quality improvement programs.

INPUTS FROM INSTITUTE

18A.3 Some categories on which the institute management can give inputs for rating could be:

Academics

- Designing and implementing relevant, need-based curriculum to suit student interests and needs. Curriculum design should take into account contemporary developments in the study area, industry interests and past feedback from teachers, students and others involved
- Data on number of departments available, courses offered, course specific data on pedagogical methods used, quality of content delivered, quality of faculty, opportunities for research are to be collected towards rating.
- Scope to offer inter disciplinary courses can count towards the flexibility of learning experience of students

Administration Process:

18A.4 Aspects pertaining to administration such as admission process, student enrolment, student representation from various socio-economic backgrounds, fee structure, scholarship / student loans, rewards & recognitions, recruitment and service conditions of teaching and non-teaching staff, faculty salary, funding allocation structure, term of faculty in institution, leadership development, financial management etc.

Teaching – Learning methodologies

18A.5 Pedagogical techniques used by faculty for teaching which include use of interactive technology, practical demonstrations, presentations, field visits, group discussions.

Teacher quality assessment

18A.6 Aspects that indicate the quality of teachers such as qualification, research interests, publications, quality of teaching, innovative practices used etc.

Institute – Industry Linkages

18A.7 Aspects that define exposure to and engagement with the industry such as industry internships, industrial site visits, research and project collaboration, curriculum enhancement and so on can be possible indicators of quality.

Further academic pursuits of students

18A.8 An understanding of what students do after they pass out can be an important criterion while rating a college. Number of students who have taken competitive exams such as GATE, GRE, GMAT, CAT and so on; number of students who give Civil Services examinations; number of students who pursue masters, research, management studies at institutes such as IIM s and other similar schools can reflect the quality of the institution. Internships and undergraduate research opportunities available to students.

Placement record

18A.9 Understanding the employment pattern of those students who have passed out needs to be factored for rating; for instance the number of students who go for employment in core engineering jobs, IT jobs, research jobs, teaching etc., and the number of students who start their own ventures. Employers need to be polled on how the students from different colleges are doing for several years.

Governance

18A.10 Criteria such asvision, mission, framework of assessment of management, department and other stakeholders, transparency of management practices, human resource practices such as recruitment, training, performance appraisal, decentralized vs centralized approach towards management etc. need to be taken into account.

Infrastructure

18A.11 To include aspects that indicate facilities available at the institute such as library, laboratories, hostel, medical help, sports & recreation centres etc. which students and faculty can make use of.

SURVEY OF STAKEHOLDERS

18A.12 An example of parameters that can be considered for survey is given here. Methodologies such as in person interviews, survey using questionnaire, focus group discussions etc. can be carried out.

1. **Student Survey**

- Teaching and Teacher quality
- Curriculum appropriateness
- Infrastructure (labs, classrooms, technology, Library)
- Exposure to Industry and Internship opportunities
- Project/research work opportunities
- Soft skill development
- Mentoring and support
- Placement cell support
- Peer students experience
- Support for Co-Curricular activities

2. **Faculty Survey**

- Access to teaching aids and pedagogical resources
- Infrastructure (staff room, labs, class room, tech)
- Salary and performance and appraisal
- Scope for training and capacity building

- Teaching Load
- Work environment

3. **Parents' Survey**
   - Facilities (hostel, building infrastructure, lab, library)
   - Transparency in Fee structure
   - Exposure college can provide to their children
   - Faculty quality (qualification, student-teacher ratio)
   - Placement record
4. **Alumni Survey**
   - Employment history after passing out of college
   - Experience as students of the institute
   - Technical knowledge acquired used towards work
   - Association with alma mater after passing out
5. **Employer review**
   - Companies that recruit students from the college can provide feedback on the quality of the students recruited, how they perform as a team, their technical knowledge, learning capacity, growth etc.
   - Prospective employers can provide their feedback on how and why they chose the particular college for recruitment.

ONLINE MONITORING

18A.13 Participation in and adoption by the college of programs towards quality improvement and resource sharing such as NPTEL, QEEE, MOOCs, teacher training programs and other such initiatives reflect on the quality of the institute. Therefore, it is important to factor in such participation towards rating.

18A.14 Aside from giving an overview of the institute's efforts towards quality improvement, it also provides rating agencies an opportunity to virtually monitor the institute. Online monitoring can throw light on the following aspects:

- Data on number of online quality improvement programs (QEEE, MOOCs, NPTEL, etc.,) that the college has signed up for

- Number of courses opted for by the college under each such program
- Number of students enrolled and receiving courses/classes through such programs
- Number of students successfully completing courses opted
- Performance of students in these courses (attending classes, taking quizzes, interacting in classes, accessing digital e-book content etc.)

For financial ratings, the differences between West and India were less, and the agencies have borrowed heavily from the best international practices.

The members of the committee should be members of at least one national academy (INAE, INSA, NAS and IAS) or winner of one of the prestigious awards in the fields of science and technology.One could include similar national academies for management.As also members of apex institutions or winner of prestigious awards in otherspecialisations falling in the jurisdiction of AICTE such as pharmacy, catering technology etc.

Chapter 19

Modifying the norms

> The danger of the past was that men became slaves. The danger of the future is that men may become robots.
> *Erich Fromm*

19.1 There are certain norms prescribed by the AICTE, which have to be fulfilled by the applicants for approval of Greenfield institutions. Some of the applicants felt that the norms were too strict or onerous, or they unnecessarily added to the expenses. The Committee gave them a patient hearing or reading and passed them on to the Approvals Bureau for decision. There are a few points which needed consideration at our level. We have dealt with these in the succeeding paragraphs.

19.2 **Library and information resources**

The library and information services available in most of the technical institutes have not been found up to the mark. More and more technical content is getting published through print and the Web every year and managing access to best out of these resources for librarians, teachers and students is a major task, which needs to be handled collectively. Access to already published resources is as important as access to current publications in print including books, journals and e-resources. Irrespective of the type and location of the institute and the courses being offered by it, its students and teachers should not get deprived by not having access to relevant publications. No library, in this day and age can buy every document that it needs for research, reference and study. AICTE had entered into an MOU with DELNET in 2001 to promote sharing of resources among technical institutes and assist institutes in modernizing their libraries. As a result many technical institutes have benefitted by supplementing their access to information. By now millions of sharable published resources of interest to technical institutes including books, journals and e-resources are accessible . To overcome the barriers in access to appropriate content it would be advisable for AICTE and the institutes to use appropriate agencies and serve the teachers and students with appropriate content in addition to regular prescribed subscriptions. When we referred to DELNET, we meant it as an example to include all other organisations of the same standard.

In addition, there should be a plan scheme of the AICTE which will help the technical institutions to build up library and information resources at the desirable level within the foreseeable future.

19.3 **Norms of subject-matter councils:**

The Pharmacy Council and the Council of Architecture have a different set of norms. Their contention is that the norms framed by them should prevail.

19.4 We cannot accept this suggestion as it is. There can be no universal rule that gives precedence to the Subject-matter Councils over the norms finalised by the concerned Board of Studies In the AICTE. In case the Subject-matter Councils feel strongly about some contentious issue, the matter should be debated in a meeting of the respective Board of Studies and their considered view should prevail. The AICTE provides the single window clearance that is desirable.

19.5 **Ban on fresh intake:**

It has been suggested that no fresh intake should be permitted in new institutions, in view of the glut that has already occurred. Such a policy cannot be accepted in a large country like ours where there are tremendous disparities among castes, communities and regions. The best approach would be for the approving authority to apply its mind in every case and take a decision on the circumstances of each case.

19.6 **Sundry norms**

The size of the class has been fixed at sixty for engineering and management programmes. For management courses the norm need not be that strict. A class size of seventy five could be permitted.

19.7 Different institutions follow different norms of teacher pupil ratios. IITs have a ratio of 1: 10; NITs have a ratio of 1: 15. It has been suggested that other engineering colleges could make do with a norm of 1:25. This suggestion could be favourably considered.

19.8 Similarly, there does not seem to be need for rigid universal norms of Professor: Associate Professor: Assistant Professor. The faculty cadre ratios were originally prescribed for maintaining an equilibrium between the lower and senior teachers. These should have been modified with the enforcement of new faculty norms. The requirement for the generality of institutions running only under- graduate programmes would be different from institutions which have Master's and doctoral programmes too.

19.9 It has been contended that even otherwise, meeting the cadre ratios of 1:2:6 for UG technical course and 1:1:1 stipulated for PG engineering and other courses seems impossible. Availability of Ph.D. candidates is less than one tenth of the requirements. Sufficient number of candidates for the positions of Associate professorships and Professors cannot be met even in the next fifteen years.

19.10 All these concerns seem to be valid and these need to be seriously and appropriately addressed.

19.11 There are strict norms of student-computer ratios. These are symptomatic of a bygone era when computers were a rarity. Today when every teacher and student owns a laptop or gadget of his own, these rigid norms are perhaps out-of-date and need to be revisited.

19.12 **Softer norms for Government institutions:**

It has been agitated by some witnesses that Government institutions should be treated differently from private institutions, as they always suffered from deficiency. There was the difficulty of getting posts sanctioned. In addition, the Public Service Commissions took their own time for recruitment.

19.13 On the other hand, the private operators complained that the AICTE treated the Government institutions with kid gloves and ignored large deficiencies in their staff, while taking a very strict view of even minor lapses on the part of private organisations.

19.14 AICTE officials informed the Committee that the Council tried to have a level playing field as between Government and private institutions. We would also advocate the same.

19.15 The norms for land have been rather rigidly followed in the past. With the onset of urbanisation, land prices have skyrocketed. As such there is a major clamour for a reconsideration of the norms.

19.16 The Govt have recently set up a Committee under the chairmanship of Secretary (HE), of MHRD to have a fresh look at the present norms for land requirement for central higher technical institutions. The Committee is likely to rework the norms and take the potential for vertical expansion into account.

19.17 It is apparent that a similar exercise will have to be done by the AICTE while finalising the guidelines for rating and accreditation agencies.

19.18 There is a similar demand for the present norms of number of classrooms required. With the progressive usage of ICT blended mode learning, there should be a lesser requirement for classrooms and AICTE will moderate the norms accordingly.

Part V AICTE'S PRINCIPAL ROLE

All the world is a stage
And all the men and women merely players

– William Shakespeare

Chapter 20

Support and mentoring

The sole purpose of human existence is to kindle a light in the darkness of mere being
Carl Jung

20.1 As discussed earlier, the Regulatory role of AICTE will become less onerous in future, providing guidelines serving as Regulations and Permissions rather than prescriptions. The excessive focus so far on Article 10(K) (permissions for new technical institutions and new courses, intake etc.) will be diluted. Regulatory function will largely be in terms of specifying norms based on quality estimates and (almost) automatic enforcing of the norms. The focus will now be on creating an eco-system for high-quality autonomous institutions all over the country by encouraging Autonomy, based on overall quality estimates. The AICTE in future will focus primarily on providing all kinds of mentoring, promotion and support for public and private institutions (without discrimination) to perform better on Quality.

20.2 **Enhancing Faculty Quality**

Quality of an Institute is dependent considerably on the quality of teachers. As Indian Higher Technical Educational Institutes have expanded rapidly, one of the primary casualties has been quality of teachers. A major AICTE focus (with the assistance of MHRD if needed) would therefore be improvement of teacher quality by a long-term multi-year teacher-training initiative. All teachers should participate in such part time programs, spending an equivalent of two weeks every year over ten years or so. Much of the programs could be provided remotely using Information and Communication Technology (ICT). At the same time, it is important to get the best undergraduate students to become future teachers. Towards this, a special program to attract the UG students who are amongst the top 10% to 20% of their class, to become teachers needs to be started. The **Committee recommends** that AICTE should fund and drive such a program. This is discussed in detail in the chapter on Strengthening Faculty. It is important that only the best institutions / teachers drive such a program. The committee notes that the existing teacher training institutes (like NITTTR) are outdated and are incapable of performing this role. The committee recommends that AICTE should set up an Empowered Committee consisting of the best faculty and

some industry subject matter experts and AICTE officials to oversee this program. It should ensure that the program does not suffer from poor quality at any stage.

20.3 **Leveraging ICT for Quality enhancement through Direct to Student (D2S) program:**

An equally important effort of AICTE would be to be an enabler to provide some high quality classes and interactive teaching material Direct to Students (D2S). This can take various forms. While MHRD initiative on NPTEL gave us a first look at what is possible, technology has advanced sufficiently to make the program far more interactive. MHRD has initiated several such programs today including several variety of MOOCs[1] and Course-pack[2]. There are experiments on Flipped classroom teaching and blended classroom model[3]. There are other initiatives like Spoken-Tutorial[4] and Talk to a Teacher, which have given some positive results. Then there are Live-classes started under QEEE program. This places the select–best teachers from IITs in front of engineering college students in interactive video classes using Enhanced A-View platform[5]. The program also uses Course-pack to measure the extent of student-participation in the program. The program differs from the others discussed earlier, as all the interaction with the students takes place in the class from a classroom, supervised by a local teacher[6]. The local faculty is involved in this program and it aims at empowering them. All these programs look promising. However, not enough data is available today to figure out the pedagogic impact of such programs. Questions such as these remain: do these programs help only the highly motivated students or also help middle-of-the-class students; which of these programs enable at least top 80% of students learn and perform better; how do the local teachers see such programs? What

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1 IITB has initiated a MOOCs program recently using Edx platform. IITM has initiated a MOOCs program under NPTEL using Google Educational platform.

2 An interactive course-work platform initiated by IITM under MHRD's Quality Enhancement in Engineering Education (QEEE).

3 A program initiated by IITB

4 A-View is an interactive video platform developed at Amrita Institute of Technology. The platform has been enhanced by QEEE technology team at IITM adding monitoring and measurements of student participation.

5 NMEICT of MHRD is providing funding for connectivity to colleges, but it will need to be scaled. This is apart from the NKN whose mandate is to connect 1500 institutes.

6 rating of Greenfield institutions should carefully look at the lab infrastructure. If the institutes do not have it, the rating should be low.

is needed is careful experimentation and evaluation, detailed discussion on strengths and weaknesses and modification of the programs, before they scale. The issues are discussed in greater detail in chapter 21.

20.4 The Committee **recommends** that AICTE should fund and drive the program to scale. It is however important that careful experimentation and evaluation is carried out to understand the pedagogic values of such efforts. It is not enough to just execute the program well, but ensure that it yields results for 80% of students. The programs that are aimed at only top few percent of motivated students need to be separated out and taken up independently. Only the programs that are able to impact a large majority of students should be scaled up. The committee recommends that AICTE should set up an Empowered Committee consisting of its officials and the best faculty and some personnel from industry to oversee this program. The committee also recommends that all higher technical educational institutes should be connected on a high-bit rate data-network; MHRD / AICTE should drive a program[5] to provide such connectivity to all institutions, irrespective of whether they are public or private. Institutions could be asked to pay full / part of this cost.

20.5 **e-labs**

Technical Education has to be much more than the theory classes. Laboratory experiments are a big and integral part of technical education. Most Higher Technical Educational Institutions have not set up adequate infrastructure towards laboratories[7] . On top of it, they lack personnel who could impart the laboratory education well. Here also ICT is providing tools which could help. Over the last few years, several e-Labs have come up. These can be used remotely and help train students. However, the e-labs are often remote simulations; while simulations could be useful to learn many things, it is important that all practical exercises are not reduced to simulations. There have been some attempts to develop a few emulators, emulating the near real life experience. The area needs far more experimentation and development. While e-labs can partially compensate for real-life experience, they do not replace development of practical skills. AICTE should encourage development of e-labs, scale-up what works and study this further. It should however put significant focus on development of practical skills, as discussed later in this chapter. AICTE should also fund development of low-cost trainers / experimenters, which could be used in technical institutions as labs.

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[7] The focus is determined by the evaluation process – the kinds of examination. Students and Institutions work backwards from there.

20.6 **Curriculum related Guidance**

One of the primary mentoring roles of AICTE would be with respect to curriculum-related guidance. AICTE would set up an expert committee consisting of highly rated faculty (Bhatnagar award winners or members of at least one of the four national academies of engineering and sciences, or similar management academy) and prominent members of industry to evolve the curriculum and teaching methodology periodically. It should be noted that curriculum designed by them is focused on social and industrial development of the country. Also, their recommendations should be considered as guidelines for the institutes and autonomous institutes to bring out their own curriculum.

20.7 The committee however notes that the Higher Technical Education curriculum and teaching and evaluation methodology needs to be revamped considerably. There should be greater focus[7] on problem solving rather than learning facts and figures. Future classes need to be focussed much more on discussion and less on lectures. The facts and figures as well as the learning material can be provided in advance using interactive ICT-based methodology. The classes should clarify concepts, discuss issues, answer questions and solve problems. Finally, the courses should have continuous evolution, with things being dropped and added every year by the teachers teaching the course.

20.8 The graduates of these institutions largely go on to work in an industry. In industry, individuals have to work as a team to deliver. It is the team-performance that matters much more than the individual performance. The educational institutions, on other hand, train students to excel in individual performance. The evaluations are all individual. It is therefore important to put certain emphasis on Group-evaluation; the students need to get to work together and perform as a team and get evaluated as a team. The work could be some practical work, but could also be some theoretical subject. Working as a team, individuals not only have to do well themselves, but also get their team members to do well. Often it is the performance of the weakest student in the team that impacts the whole project; the ability of others to pull up the weakest and get them to do their best is an important trait and skill that needs to be learned. The committee recommends that AICTE should guide its Technical Institutions to introduce 10% to 20% of overall evaluation of a student on the basis of group-performance. This would probably be the first of its kind and may make the Indian Higher Technical Educational Institutions unique.

20.9 **Practical-oriented Education**

Another important aspect which is weak in most technical Institutions in India is practical oriented education. Industrial Training or Internship has been introduced by many; however with number of students being quite large, not all students get the opportunity for such training. Often the students who get the opportunity do a poor job (they do not take the training seriously) and the industry personnel just gets to spend time with them without getting any meaningful output; this hurts future students as the industry is unlikely to take interns in future. Also, the industrial training does not adequately replace the lack of practical training for students. The practical aspects need to be interwoven throughout the education. The courses and the teaching need to have certain practical orientation, even when the subject is basic and theoretical. The faculty themselves often lack the practical-orientation. The Committee recommends that all faculty of these institutions should spend their alternate summer working in industry. This would give them some industry exposure and help bring that focus in their teaching. The Committee also recommends that it will be desirable to have some high-quality Industrial personnel as adjunct faculty (full time / part time). They could teach modules of a course (consisting of 6 to 10 classes) or courses with partial credits (instead of full-course). One need not insist on Masters or PhD qualifications from such personnel and let their experience be counted against academic qualifications. However, the number of such active adjunct faculty should not exceed 25% of total number of faculty at an institute.

20.10 The Committee also recommends that all undergraduate students at these institutions should take up a one- semester project involving designing and building of a complete product. May be two students (not more) could take it up jointly and spend 50% of semester time (earning 50% of normal semester credit) on such a project. Design is to be integrated as an essential part of the curriculum and it is recommended that some humanities and business course-modules around product design, development and commercialization be introduced. The Committee further recommends a certain focus on Inter-disciplinary courses. Finally, the Committee views that all the students graduating from higher technical education institutions need to have acquired certain minimal IT skills (working with IT systems and not programming) as well as considerable soft-skills.

20.11 **Guidance in Administrative Matters**

AICTE should prepare templates for good governance of higher technical educational institutions. It needs to emphasise the use of IT at all levels for smooth and efficient functioning. At the same time, it is important to have transparent governance and

management on all matters of the institute. AICTE should create a model of governance in a quality autonomous technical Institution. While the board should be fully empowered to take all administrative decisions for the institution, the board itself should have mostly high quality independent members. The founders should not have more than one person on the board from their family. The others should be from reputed academic personnel, reputed industry personnel and academia. The board must not have any nominee of the Government or anyone connected with active politics.

20.12 The management of the institution should be selected by board sub-committee consisting mostly of independent members. All academic decisions should be taken by faculty-senate or equivalent, consisting of all professors and a few Associate Professors and Assistant Professors. The finances of the institution, fees collected (and fee-charged for each program), salaries paid, expenses on infrastructure should all be on a website. The rating committee will spend considerable effort in validating the transparency and governance practice of an institution..

20.13 AICTE should work-out a training program to train the personnel for taking administrative responsibilities. One of the weaknesses in many of these institutions is not having sufficient number of faculty and staff who possess leadership skills. AICTE should identify young and talented faculty and staff, who could be potential leaders in educational institutions and take up management roles. AICTE should identify suitable management courses for such personnel.

20.14 **Funding**

One of the roles of AICTE must be funding Technical Educational Institutions. The Committee recommends that AICTE should make no distinction between public and private institutions in deciding its grants. The Committee further recommends that the funding and quantum of funding should be linked to the rating of the Institutions. An Institution with higher rating should qualify for larger grants, whereas an institution which gets rated lower than a certain level, should not get any AICTE grants.

20.15 The funds provided by the AICTE could be for infrastructure development as well as for enhanced interaction with industry and promotion of entrepreneurship. AICTE should also fund research in the area of Education Technology. However it should not attempt to fund R&D in S&T, and it should leave that to organisations like DST and DBT and to the various Government departments. On the other hand, AICTE should have a pool of funds for post-graduate scholarships for all technical educational

Institutions and should attempt to provide that to students in institutions which have high rating.

20.16 **Infrastructure-related support**

AICTE should set up a National Centre for Futuristic Education to manage infrastructure and support all the Technical Educational Institutions using outsourcing. It should help institutions get access to e-books, e-journals and e-library resources at a bulk rate.

20.17 AICTE should set up an on-line repository for grade-cards and degrees for all graduates of technical educational institutions, including all courses and degrees of all distance education courses related to technical education. The grade-cards and degrees should be authenticable and easily accessible.

20.18 Finally AICTE should ensure that all technical institutions are connected to each other on a high bandwidth network, which is also connected to all e-education infrastructure and Internet. NKN has already taken an initiative to connect several higher educational institutions. NMEICT program of the MHRD extended the network to many other government technical institutions. However, only a few private institutions were connected. The Committee recommends that one of the key goals of MHRD would be ensure that all technical institutions, whether in public sector or private sector (after all they are all our children), are connected to this national educational network using significantly high bandwidth. It may decide to charge them differently.

20.19 The recommendations to connect all technical institutions, whether in public sector or private sector, are connected to the national educational network is in line with Digital India program of government of India. The Digital India program aims to empower India's citizens, without any exception, by providing affordable access to Internet and to all services and on-line resources. This will be rather incomplete, without providing such access in all technical colleges. In fact, the committee feel that all schools and colleges in India should be connected to such a network as a part of Digital India program.

20.20 **To conclude**

It is often said that a quality institute is built on the pillars of Autonomy, Adequate Funding, Responsible Management and Quality faculty. This report has emphasised the importance of Autonomy. This section has discussed the support that AICTE needs to provide towards getting Quality faculty and also the role it can play in

funding. It will further discuss the importance of adequate financial resources that every institute should have while discussing the guidance that AICTE should provide in the matter of fee-fixation. The fourth pillar, Responsible Management, needs to be starting point of all educational institutions. AICTE will depend on rating to ensure that an institution indeed has responsible management and in case it does not, whether it needs to be either merged with another institution or get closed.

20.21 In Part VI of the report, some of the other regulatory tasks that AICTE should take up will be elaborated.

Chapter 21

Leveraging ICT

> Not I nor anyone else can travel that road for you. You must travel it by yourself.
> *Walt Whitman*

21.1 Leveraging ICT for Quality Improvement through Direct to Student (D2S) program

India has witnessed phenomenal growth in higher education in terms of access, equity and inclusiveness, resulting in the massification of higher education over the past few decades. However, this rapid expansion has not been matched by a corresponding improvement in quality. A number of issues such as lack of infrastructure, poor quality faculty, huge vacancies in teaching positions and outdated pedagogical methods contribute to this quality problem.

21.2 Over the last few years, ICT has emerged as a powerful tool to possibly overcome this problem. ICT could be used to get powerful courseware direct to students (D2S). This courseware could be simple audio-visual learning material (like ones used in conventional Distance Education programs) or video lectures (like in NPTEL) or short lessons using audio and white board (as in Khan Academy) to convey concepts. On the other hand, it could be more interactive course material (like in MOOCS) or even live classes (as in QEEE). A large number of such initiatives have been undertaken in different parts of the world (including a number of initiatives in India) over the last few years. In fact, there has been quite a hype built around some of these initiatives with claims being made that some of these initiatives would result tomorrow into virtual universities replacing the conventional ones.

21.3 While there are enough examples of some students benefitting from each of these programs, there is no systematic data on the extent to which D2S programs have helped students overcome the limitations of having quality teachers. There is little doubt that the most motivated students are helped by these programs; they can use any of these to access quality courseware and benefit. However, once we go beyond such students, the benefits are not as clear. Does any of the programs help 80% of students in a class, or even 50% of the students? Is there any role for local teachers in such programs? Is classroom and interaction amongst students important for learning, or virtual interaction would be as good? How important is interaction between teachers

and students for learning, or would virtual on-line interaction be as good? There is no serious data or study to answer these questions; however there are many claims?

21.4 In spite of these limitations, there is little doubt that ICT is a powerful tool and to a significant extent, it can be used to overcome the limitations of quality teachers and in fact help build up teacher quality for future. The question is how?

21.5 **Existing models of ICT based education**

After years of experimentation, the use of ICT by teachers and students has finally had some impact that is felt globally. Use of ICT enables multitude of activities such as incorporating external resources, collaborative learning, learning management systems as well as evaluation and record keeping. By allowing integration of audio video simulation and participation, the quality of learning is expected to go up. The use of ICT makes quality teachers and content available to students located anywhere in the world.

21.6 Many higher education institutions worldwide are using ICT for various education related activities such as developing course material; delivering content and sharing content; conducting quizzes and tests; evaluation and feedback; communication between learners, teachers and outside world; creation and delivery of presentations and lectures; academic research; administrative support and student enrolment.

21.7 MIT open Courseware, Coursera, Khan Academy are amongst the most known programs in USA. Khan Academy which offers free videos and tutorials on almost any topic to learners across the globe also provides tests based on their skill level and performance (Khan Academy, 2013). MIT Open Courseware, by far the most popular open source online learning platform, in its eleven years of existence, has offered courses on wide ranging topics and is working towards certification of courses learnt through this medium. Coursera is an initiative that partners with top Universities around the world to offer courses to students for free. In India, NPTEL (National Program on Technology Enabled Learning), has created a large number of engineering videos through IIT faculty and have been made available to students of various engineering colleges. More recently, there are MOOCS programs from some of the IITs. Spoken Tutorial is another such program to help students. Individual students in different institutions have enhanced their learning using these programs while preparing for various advanced examination, for example GATE examination, or for preparing for a job-interview. There is enough evidence that motivated students have used these material and platforms to enhance their learning. These courses are being often used by graduated students working in industries, as and when their

vocation requires them to refresh the learning in some subjects or learn some advanced topics. The impact of all this for others have been mixed.

21.8 It is crucial to note that all of the above mentioned platforms are stand-alone and directly reach out to students bypassing the local University and local teacher set up. Though they have achieved considerable success and popularity, these models are based on the premise that users have 'access' to digital technologies, are competent with the language of teaching and computer usage and are self starters. This narrows down the user demographic and caters only to a limited set of student population. Therefore it is yet to be determined whether such a system can bring about sustained quality in education for students at large.

21.9 There has been some thinking in recent times that ICT based learning should supplement rather than replace the local teachers. In fact, ICT should also be used to enhance the capabilities of the local teachers and empower them in all possible ways.

21.10 In this scenario what can be recommended is a calibrated approach, where the above discussed 'direct-to-student' modes would supplement the teaching at institutes, rather than bypass it. Bypassing the university context only diminishes the cultural aptness of such initiatives.

21.11 **Suggestions for alternate modes**

The true potential of ICT can be better realised when we explore newer and better methods of teaching by creating interactive and engaging educational platforms and situate them in the context of a classroom set-up. This can be potentially used to establish a student-centric approach to teaching and learning by encouraging inquiry, invention, interactivity and learning by doing.

21.12 Institutions can leverage ICT in improving pedagogy and the quality of content in the following ways:

21.12.1 Live delivery of high quality lectures using video on high speed internet

As new IITs were set-up in the recent years, an older IIT was made a mentor institute for the new IIT for the first two years. During this time, the faculty for the older IITs taught students in the new IIT, largely using the NKN (National knowledge Network) fibre optic connectivity. The courses were taught live with faculty from older IIT taking interactive classes using video on NKN. The classes were very successful, with the students feeling that the teacher was present amongst them.

21.12.2 With NKN being expanded connecting most of the universities and colleges,

it is possible to connect the best teachers from IITs and other institutions to a large cross-section of students across the country. Top faculty from premier institutes could deliver live lectures to students situated in different colleges and also use high quality multimedia resources to illustrate and consequently enhance the learning of a wider student community. The idea behind such lectures is not to bypass the local classroom set-up or the teacher, but to complement local teaching. In this method a faculty from a premier institute could deliver a select portion of a course simultaneously to all institutes. These sessions will simulate and bring into play the dynamics of a typical live classroom scenario with the added dimension of technology-enriched content and delivery. The goal would be to utilize high quality pedagogical resources - human in the form of skilled instructors as well as technological like multimedia resources, to make learning accessible and easy to assimilate for the student community at large.

21.12.3 *This model has been tried in the context of an MHRD led education initiative called Quality Enhancement in Engineering Education (QEEE) that began in Jan 2014. In this program 150 Tier II and III engineering colleges pan India receive 'Live video classes' delivered by IIT faculty on select engineering modules. These sessions are delivered from the IIT studio directly to the classrooms of participating colleges via certain hardware-software communication infrastructure. This technology supports two way interaction that enables dialogue, delivery and feedback between the IIT faculty, teachers and students. This methodology is also being used as a platform to connect students from remote colleges to industry representatives to understand technological trends as well as employment prospects. This way the platform enables a scenario where students are given an exposure to the industry environment which they otherwise might not have had.*

21.12.4 **Interactive e-books**

ICT tools can be used for the creation, distribution and sharing of multimedia content, which can provide a rich educational experience to students. For example, tools for publishing and creating interactive eBooks (Electronic Books) for courses have been developed in the last few years. In these interactive e-Books, the core textual resource can be augmented with appropriate videos, animations, illustrations, translations, links to external reading material, quick presentations and quiz/assessment modules. Dictionary and translation tools can also be embedded to make these e-Books a comprehensive self-learning tool. Taking it a step further, creating a collaborative learning forum for discussion and text chat capabilities in the eBooks will enable students to interact with each other while reading the eBook as well as post doubts and comments on the forum. Along with the designing of such interactive eBooks, efforts have to be taken to encourage teachers from premier

institutions to create content using such tools and to aid in their adoption by the students.

21.12.5 *One of the most interesting part of these e-books today, is that they have capabilities of capturing every stroke that a student carries out while interacting with these e-books. The amount of time that a student spends on each page, how long she watches the video, whether she clicks on the references, answers the quizzes, (correctly or wrongly), participates in the forum – all these data are captured and can be sent to the cloud. At the cloud, an analytics engine can analyse the data from all the students and can figure out the pace of progress of the student, the specific difficulties that she faces, the extent of interest she takes in the course and the competence she demonstrates. This analysis (as compared to other students) could help the student to figure out where she is in academic preparation and what corrective measures, if any, that she needs to take. This is elaborated further in the section on Student performance tracking.*

21.12.6 *In the context of QEEE, interactive ebooks (called Coursepacks) are being created for the modules that are being delivered as Live Classes archiving the content for future use. In addition to hosting textual content it will also feature recorded videos of the live classes. These digital repositories of content are an attempt to create a comprehensive teaching and learning capsule that can be used in future semesters by colleges in the absence of live interaction with IIT faculty.*

21.12.7 **e-Quizzes and evaluation**

The use of ICT in education also presents educators with the scope of using innovative methods to test and assess the learning outcome of students. Conventional techniques of evaluation can be replaced with creative alternatives such as educational games. Subjective (exact answer) as well as objective (short answer/ essay type) tests can be conducted and evaluated using ICT tools, where the scope of evaluation can be both computer and human based. Furthermore, continuous monitoring of performance is also possible.

21.12.8 Adopting ICT for conducting quizzes and evaluation would not only be more attractive for the students but will also aid instructors to test the learning competency of the student in a more effective fashion. The wide usage of these testing mechanisms will boost the quality of the entire teaching, learning and evaluation process.

21.12.9 **Student performance tracking and feedback**

Of all the advantages brought in by this technology, the greatest is its scope to individually track student performance and provide feedback on the student learning

patterns, as discussed earlier. For instance technology can capture data on: when did the student study, how long did he/she study, which section did he/she spend more time on, how many times was a quiz attempted and other such information. Analysis of the collected data can be provided in the form of reports to the student, teacher, parent and other stakeholders involved. This way, educators will enable to get a clear understanding of the strengths and weaknesses of student. Teachers will also be enabled to customize their lesson plans, teaching methods and evaluation techniques according to the needs and capabilities of students. For example, *reports based on Coursepack data in QEEE program is being provided to the local faculty for their understanding of student progress.*

21.12.10 **Platforms for collaborative learning and group learning/ Tutorials:**

Group learning in the age of technology can be extended beyond the limitations of time and space. Tutorials are an important supplementary e-educative tool based on the concept of peer learning through pre-planned informal study circles. It brings together students and teachers on a web based platform simulating a classroom set up for both teaching and learning purposes.

21.12.11 The collaborative nature of these study groups will enable more effective delivery of new course content and foster participatory learning with/without the virtual presence of the facilitator. This web based application essentially looks to integrate crucial aspects of follow-up and revision into current curriculum delivery practices through a virtual interactive mechanism that is both synchronous and in real time.

21.12.12 Virtual groups can be formed to view a video (a recorded lecture), share a document, read a book, or any other resource in a synchronous fashion while being able to text, audio and video chat simultaneously. This results in synchronous learning and enables an ICT based collaborative learning/tutorial platform. Such tutorials augment the learning done by any student in a classroom.

21.12.13 **Virtual labs for lab experiments and practical learning:**

Majority of educational institutions in India lack good laboratory infrastructure due to the high costs involved in setting them up. In this scenario, technology alternatives that can overcome these constraints and supplement classroom teaching are gaining popularity all around the world. Virtual labs are an upcoming technological component that looks to provide virtual hands-on experience to students on experiments undertaken remotely at a premier institute. By creating an opportunity to work on a real lab experiment tailored to suit their syllabus and curriculum, it

provides students and teachers alike, a chance to access resources and material normally available only to select students at a few premier institutes.

21.12.14 Virtual laboratory is one such tool that consists of several technologies such as simulations, animations, videos and remote triggered experiments which facilitate user interaction. Also, it allows for institutions to share costs and enables proliferation of quality labs. By setting up virtual labs across the country, students can complement learning by doing. As mentioned previously, it is one of those few technological options that enables cost effective and space saving opportunities for innovative learning and thinking.

21.12.15 **MOOCs:**

Open courses are online courses that aim at large scale interactive participation and open access via web. They are typically courses which are not credited and are available free of cost. In addition to conventional educational resources such as reading material, videos, problem sets etc., they also enable the creation of an interactive user forum of students, teachers and tutors.

21.13 Expected benefits for institutions

In summary, by leveraging ICT the following benefits can accrue to the participating institutions

- High quality pedagogical resources that have so far been available only to students in select institutions can now be made available to a wide cross section of students. These include qualified and skilled teachers as well as well-crafted content.
- An active learning environment can be created to ensure greater student involvement and interest, for example, tutorials that aim to engage students in an interactive set up for group study purposes.
- Engineering labs are expensive to set up and require skilled manpower. Hence, students in several colleges do not get exposed to many hi-tech labs. Virtual Labs will fill that gap by making available these labs to students across the country. This will greatly improve the quality of engineering education being imparted.

Chapter 22

Strengthening faculty

I am not a teacher but an awakener
Robert Frost

22.1 One of the major issues being faced by most higher education institutions and especially technical institutions in delivering quality to students is the challenge in attracting quality teachers. Apart from attracting new teachers, the challenge also lies in improving the quality of existing teachers. Technical institutions cannot provide quality education unless they have faculty who are motivated as well as desirably skilled.

22.2 In order to realize the avowed objective of engineering colleges, it is necessary to bring in some changes. First, institutions must be able to attract and hire high quality faculty. Second, the senior/existing faculty should also be motivated towards excellence in teaching, technology development and research to help institutions deliver quality education.

22.3 This chapter suggests a few methods to consider towards strengthening faculty in engineering colleges

22.4 **Motivating the best UG students in the country to be the faculty of tomorrow:**

Currently, there is a severe shortage of faculty in technical education in the country. The proposed scheme is expected to fill the gap between demand and availability of quality teachers by encouraging fresh UG graduates and nurturing them to take up teaching positions. They will do so while simultaneously pursuing their Masters cum Ph.D. program from one of the IITs or IIMs or similar institutions.

22.5 The program proposes to recruit some of the best under-graduates of technical program (i.e. top 10% to 20% meritorious students from any UG institution in the country) who can be motivated and mentored into teaching. They can be engaged as "Trainee Teachers" initially, as they would assist in teaching and simultaneously pursue part time Masters-cum PhD programs of IITs or IIMs through remote classrooms (via video) to acquire higher academic qualifications. While the courses will be done via video, they may spend one to two semesters at institute where they register for research.

The rest of the research will be carried out by remotely interacting with their guides at IITs / IIMs. These graduates can fulfil their aspirations to receive their degrees from leading prestigious institutes in the country in this manner while they also train to be teachers. Educational Institutions should be encouraged to visit campus to recruit these students as trainee-teachers at an early stage, before the industry goes for recruitment. The number of students that an institution is able to recruit in this manner, could be used as a benchmark in rating the institution.

22.6 In summary the motivation of this effort is to:

a. Create high quality teachers

b. Provide attractive teaching cum research career path to the UG student

c. Incentivise bright UG students to enable them to 'Teach and Earn while you Learn' and providing top class training to become good academicians / researchers.

22.7 The Trainee Teachers will mainly help the institute in laboratory and tutorial course work while carrying out research in parallel. They will progressively play bigger role in teaching, academics and research. They will be like the Contractual Employees with annually increasing consolidated salary on an equivalent scale (compensation higher than a regular PhD fellow but lower than an Assistant Professor) with regular leave and allowances. Also all the fees and some professional expenses towards the Masters-cum-PhD programme will be reimbursed by the institute. Part of the salary could be retained by the Institute, placed in Recurring Deposit (RD) and this would be returnable to the trainee in a phased manner, only after successful completion of PhD and their continuing as teacher in the institute for at least a few years.

22.8 It is expected that the Trainee Teachers complete Masters-cum-PhD in about 5 to 6 years. However, if a candidate fails to complete his/her PhD within eight years, his/her candidature to be in this scheme could be discontinued. In such a case the amount kept in RD could be forfeited.

22.9 After successful completion of the PhD, the trainee teacher should be absorbed as Assistant Professor at appropriate pay scale in the parent institute and service rendered as trainee will be counted for various benefits admissible to employees of the institute.

22.10 **Continuous teacher training programs and certifications**

Along with recruitment of quality faculty, it is equally important to ensure continuous upgradation and enrichment of existing faculty, not only with respect to subject-matter, but also for new and advanced pedagogical techniques for improved quality of

interaction with students. The following suggestions aim to achieve this objective by developing a teacher training program that can be implemented in all technical institutions.

22.11 The broad guidelines for the program include:

- The proposed program should be for 10 years, broken into 5 modules with certification every two years. There could be a total of 5 levels of certification.
- Each level could be a thirty day program spread over a period of two years. It could consist of two 5-8 day contact sessions, which are conducted in person as summer or winter-school. The remaining program may be offered on-line by making use of NKN or other available networks. The virtual sessions may be conducted on Saturdays or evenings with live or pre-recorded feeds in the form of lectures, tutorials, lab demonstrations, etc. Each program should involve assignments and evaluation, and certification should be provided only on the successful completion of the program by the candidate
- This five-level certification course should focus on content as well as pedagogy. A young teacher is expected to clear the five levels in ten years. On clearing each level of certification, the teacher should be incentivised by the Institutes
- The evaluation could include recording and examining of some of the regular classes of the faculty. The number of teachers at various level of certification can count towards tier-evaluation of the institute.

22.12 **Workshop by IITs and IIMs**

Various IITs, IIMs and similar premium institutes may periodically conduct a 3 to 7 day intensive workshop in major disciplinary areas (for example mechanical sciences involving Mechanical Engineering, Applied Mechanics and Aeronautical Engineering and Engineering Design). Faculty from colleges should participate in the workshop with faculty members from different IITs and IIMs.

22.13 The workshop could examine the state of teaching and training in the respective area, make recommendations on curriculum changes, elaborate on different pedagogical methods to teach specific concepts, discuss state of engineering and R&D or management practices in the area and coordinate joint-projects between IITs / IIMs and these institutes

22.14 The workshops could essentially discuss how to take the discipline forward and also to enhance research-culture in various institutes. It could also be coupled with some

short-term intensive course for teachers. It would be good if there was also one or two days of leadership training at such events.

22.15 There should be an announced timetable and teachers can plan to attend. All teachers should have to attend some weeks of training before their next promotion and these could become good candidates for such workshops.

22.16 **Research participation enhancement**

The committee suggests that in addition to the above, teachers from the educational institutes could also be trained on "how to write proposals and carry out research". Some suggestions towards this are:

- 10% of top faculty likely to do research can be encouraged and trained on writing proposals and managing government/ private funded projects
- They could potentially partner with guides/mentors who will be faculty from IITs or IIMs to carry out research. They could also partner with other faculty from similar private institutions
- The performance of colleges with respect to teacher training in any college is to be linked to rating and eventual academic autonomy of the college/university

22.17 **Recommendations**

AICTE should play a major role in driving the programs described here. It should set up a committee which would focus on this. This should be a major responsibility for AICTE.

Chapter 23

Redesigning the plan schemes

Money makes the mare go
Old proverb

23.1 This chapter was the most difficult to write, for the following reasons:

(i) The Government recently abolished the Planning Commission and constituted a Niti Aayog. It was not immediately apparent what the future of the planning process would be. As nature abhors a vacuum, perhaps some kind of planning would continue and the allocation of funds would be decided between the administrative ministries and the Finance Ministry.

(ii) MHRD has been historically quite measly in allocation of funds to the AICTE. Against an allocation of anything from Rs. 300 to 400 crores for each IIT, the AICTE allocation was in the neighbourhood of Rs. 200 crores. Imagine having to spread the allocations over thousands of technical institutions which were under AICTE's jurisdiction.

(iii) Even so, the AICTE has manfully suffered in silence and invented as many as 28 plan schemes for student improvement, faculty improvement, research and infrastructure. The spectacle was so pitiable that we did not know how to redesign the schemes. The total kitty was so abysmally meagre that if you allotted a little more to one scheme, other schemes would get left out.

23.2 Accordingly, after a few valiant attempts and discussions with the Acting Chairman, we came to the conclusion that a minimum allocation of Rs. 5000 crores would be required if some sort of beginning was to be made in the direction of improving the quality of technical education in this country.

23.3 Quality depends mainly on two factors: autonomous functioning and adequate funding . Whether it is the Oxford University which draws munificent grants from the British Government, or a ramshackle business school that struggles for existence in Jhoomri Talaiya, both require funds. If an institution cannot raise funds through high fees or from a rich philanthropist or from the government, finance is a big big factor.

23.4 We shall revert to the subject in Chapter35 on "enhancing budgetary resources."

Part VI : REGULATION-ORIENTED TASKS AND ADVISORY ROLE

An investment in knowledge pays the best interest

– Benjamin Franklin

Chapter 24

Regulation-oriented tasks and advisory role

Control leads to compliance, autonomy leads to engagement
Daniel H. Pink

24.1 As discussed in previous section, the committee has recommended that AICTE does minimal regulation and plays more of the Advisory and Support role. We started emphasizing the importance of autonomy for the institutes to attain quality and suggested rating as a fulcrum of continuous quality estimation of an institute, aided by accreditation. We then discussed the support, mentoring and enabling role that AICTE needs to play in getting the higher technical educational institutes to attain quality. In various chapters of part VI, we will examine the changes required in the regulatory role that AICTE has conventionally played, other than that associated with starting an institute, granting permission for courses and closing down institutes. The latter, as we discussed earlier, would be based on ratings that an institute acquires and the role of AICTE would largely be to act somewhat automatically, based on the ratings and Accreditation and the policy.

24.2 **Areas of responsibility in Technical Education**

Today the technical institutions in the following areas come under the ambit of AICTE.

- Engineering and technology
- Information technology
- Management
- Pharmacy
- Architecture
- Town and country planning
- Applied arts and crafts
- Hotel management and catering technology

24.3 The Technical Educational Institutes, governed by AICTE in all these areas offer

Diplomas as well as Degree courses at both undergraduate and post-graduate level. The **Committee recommends** that AICTE should continue to regulate all these institutes and further recommends that AICTE alone should have the regulatory role for all such institutes, irrespective of whether they are affiliated to a university or not. The **Committee recommends** that even the universities which directly offer the above programs should be regulated by AICTE alone, with respect to these programs. However, as discussed in the section on estimating Quality of Technical Education, the regulations will be based entirely on ratings and Accreditation and in accordance with policy decided by AICTE committee. AICTE would have no active role but to act somewhat automatically to permit the starting of institutes and order the closing down / merging the institute with others based on the above. Ultimately all the institutes would have to become fully autonomous and decide on their own programs and the size of the class. Till they become autonomous, the programs and class-sizes would be governed by AICTE, again solely based on rating, accreditation and the policy. Also, no Technical institute or university will be allowed to have a graduate program, unless they have a certain rating scores and have been accredited by NBA.

24.4 The programs which are not under purview of AICTE today will continue to be independent of them. The technical institutes of national importance (like IITs and IIMs), as enacted by the parliament, will not be regulated by AICTE. However, they are expected to play a major role in ensuring that AICTE is able to strengthen technical institutes in the country and participate in its committees and drive its programs.

24.5 The committee notes that in recent times, the health system in the country is rapidly evolving with a certain focus on programs on IT, Instrumentation and Equipment. It therefore recommends strengthening of the programs on Health Technology at both diploma as well as undergraduate engineering level as large number of technicians and engineers will be required.

24.6 **Guidance for Fee Regulation committee**

The committee notes that for Technical Educational Institute to attain Quality and flourish, they must be financially sustainable. While Government colleges are funded by the budget based on estimated expenditure minus revenue from fees, this is not so for private educational institutes. Since the bulk of technical institutes today in India are private (either supported by Government or otherwise), it is important that their revenue is sufficient to take care of their current expenses as well as renewal and development of infrastructure. The revenue can be from Government support, from donations received, fees charged from the students and any other earnings. The

financial sustainability requires that fee needs to be fixed such that taking all the revenue sources into account, the institute does not fall short of incurring all its legitimate expenditure, including proper salaries for faculty and staff, expenditure on infrastructure support and maintenance, management overheads as well as funds for renewal and expansion of the institute. Quality must not suffer due to shortage of funds.

24.7 AICTE should not decide the fee. Ideally a fully autonomous institute should decide its own fee. But the Indian courts have recommended setting up of a fee-regulatory committee. There are similar committees at the state level. The role of AICTE should therefore purely be advisory, advising these committees and institutes on fee-norms. If need be, law needs to be amended so that AICTE can advise on fees to the fee-regulation committee. AICTE should categorise different institutes as per their different levels, faculty requirements, student-teacher ratio and infrastructure requirements based on the objectives that institutes set for themselves and the ratings. For example, an institute offering graduate programs will require a higher teacher to student ratio compared to another which does not have such programs. The fee-guidance should therefore be different for Institutes at different levels. The **Committee recommends** that AICTE should set up an expert committee to estimate the costs for institutes at different levels (some model institutes could be imagined) and advise on the fee-amounts for institutes at these levels. It is however important to ensure that Tuition as well as all other component of fees (for example development fees) should be clubbed, and no institute should charge any capitation fees directly or indirectly. The total fee amount for each institute for each program should be transparent and published at the website, along with the faculty salary-levels and other expenditures. The rating agencies should ascertain that the institutes are financially sustainable, that they are charging the students no more than what they have declared and paying the faculty-salaries as per their declaration; the anonymous survey that the agencies carry out should be used to ascertain the facts, and institutes which violate these norms should have the lowest ratings.

24.8 The committee further notes that the Fee structure should not be populist and should cover the complete cost. However, AICTE as well as the institutes should do their best to see that no student is denied an opportunity to study due to lack of financial resources. While student-scholarship should be instituted widely (Government funds as well as CSR funds could be a good source for this), bank-loans should be provided to all those who need these. One could link the bank loans to Aadhar and all wilful

defaults should be reported to CIBIL. Finally, the **Committee recommends** doing away with Management Quota completely. The **Committee recommends** that technical institutes however should be able to charge different fee-amounts to students of different categories, as long as it openly declares it and puts it on website and the rating agencies could verify this. This would enable it to become financially viable and still charge less (than the cost) fees for a section of the students.

24.9 Having said that it is important for India to have technical higher educational institutes which are affordable. The graduates should be able to repay the loans that they take for education using the salaries that they earn in the first few years. If that is not the case, all attempts should be made to either reduce the cost of education or generate other resources so that the students are not unnecessarily burdened. The Government should progressively increase the grants that it provides to the technical institutes so as to reduce the fee burden. Similarly, corporates which provide grants for educational institutes, should be given considerable tax-break. They should also be able to use CSR funds towards this. To reduce the costs, one needs to revisit the recommended ratios of Professors /Associate Professors and Assistant Professors and their qualifications (more on it later in the Section). One should also revisit the norms that have been in place for infrastructure. *The focus has to be on high quality affordable education. Neither the quality can be compromised, nor can affordability be compromised.* While quality faculty and infrastructure is required for quality of an institute, neither the seniority of the teachers nor the expansive infrastructure automatically implies quality. Outdated norms like student – computer ratios or numbers in the days of Internet, mobiles, tablets and laptops should be done away with; similarly norms regarding physical books in library in the time of e-book revolution is less important than high-bit rate connectivity and subscription to e-books and e-journals. rating of an institute should ascertain that students have access to Internet and Computing Resources and to e-books and other Internet based educational materials.

24.10 Finally, the **Committee highly recommends** that AICTE should encourag edevelopment of lab equipment which is high on pedagogy and skill-enhancement and low in costs. This should be a major challenge that AICTE should take up.

24.11 **Regulations regarding faculty qualifications**

PhD is not necessarily a measure of quality; there are too many PhDs who are poor faculty members. The first requirement is that the faculty must have been good student to begin with and can teach well; since it is highly desirable that all faculty for

undergraduate courses must have high degree of width as well as depth in their knowledge, they must acquire Masters and PhD in due course. However the Masters and PhD program that they pursue must be of high quality in a high-quality institute. This is even more important for graduate programs. As discussed in the chapter on "Strengthening Faculty," there is no need to have norms or advisories that the teachers must have Masters or PhD to begin with. One should prefer trainee teachers, who are in top 10% to 20% of the class and who simultaneously register for PhD at a premium institute like IITs and IIMs, rather than a medium to low-quality PhD as faculty. The rating of an institute should determine how quality faculty is in the making.

24.12 The requirement of a PhD degree for a faculty makes even less sense when one comes to teaching courses in a diploma program.

24.13 The **Committee recommends** that AICTE should use rating to determine the quality of faculty and provide support to the institutions to develop quality faculty as discussed in the chapter on "Strengthening Faculty," rather than necessarily having PhDs to begin with. Similarly, AICTE should recommend that no faculty should have to teach more than 16 hours (including lecture and labs) per week (both for government as well as private institutions). Autonomous institutes should decide this for themselves, based on what other roles each faculty is performing.

24.14 **Finally**

Current regulations regarding Distance Education would be discussed in chapter 26. Issues regarding conflicts between different regulatory . Government bodies and their overlapping roles will be discussed in Section VIII. It is to be noted that a number of recommendations provided in this report would require changes in Acts and Statues. These have been explained in the Appendices.

Chapter 25

Entry and exit tests

> Well, tests ain't fair. Those that study have an unfair advantage. It's always been that way.
> — *Allan Dare Pearce*

25.1 Reforming the entrance exam:

In the new age one has to actively look at ways to do away with the entrance exams and perhaps exams in general. We do need to evolve a better way of judging the quality of students. But till one comes up with such a method, we cannot do away with exams. What we can do is minimize the number of exams a student has to take to get entry into technical institution, and also create an ecosystem wherein if one misses an entry exam it does not have an impact on the whole future of the individual. Moreover, to adjudge the quality of graduating students, it may be worthwhile considering an exit exam.

25.2 One National level exam for all students under AICTE

Today a student takes a plethora of entrance tests for entry to an institution under AICTE – and this over and above the board exam. For example, JEE Main for engineering, CMAT for management, etc. Moreover, most states have some form of an entrance test – Common Entrance Test (CET). There are some states like Haryana, Tamil Nadu, that do not have CET. Several deemed universities and private universities have their own tests and criteria for admission. It is proposed that a National Testing Agency be established under AICTE. It will endeavour to have a single national entrance test for all institutions under it. For example for management it will be CMAT only, for engineering, AICTE could use the services of JEE Main (nearly 13 lakh students take JEE Main) conducted by CBSE rather than start their own entrance test. It will be very easy to generate national ranks as well as State wise ranks through such entrance tests.

25.3 On line test with multiple offerings per year

It is time to have a different model for holding an entrance test, so that it is offered many times a year. One big advantage of a multiple offering is that it takes away the pressure from the student and offers him an opportunity to try again without losing a year. It is to be kept in mind that if students miss the entrance test due to illness or other personal reasons, they do not just lose a year, but also lose motivation and zest for learning –

believing that the system is unfair and they have been punished for no fault of theirs. Technology today helps us in overcoming this problem. Moreover, with multiple offering the burden of conducting the tests will be reduced, although the test has to be conducted many times in a year. It is recommended that the test be conducted at least three times a year, preferably four times a year.

25.4 Need for question banks

The entrance test, besides going online must develop a large bank of questions so that it can easily offer this exam many times in a given year. A question bank is already being developed so as to create multiple papers during a test, thereby eliminating the menace of copying. All one needs to do is increase the questions in the bank so that the test can be offered many times in a year with multiple question papers for each offering of the test. Most international tests like SAT, TOEFL, etc. are already being offered several times in a given year. Also, a student can be allowed to take the entrance test multiple times and we should use the best score for admission.

25.5 Exit test and rating:

All engineering institutions under AICTE are encouraged to ask their graduates to take GATE as an exit test. This will ensure quality of graduates under different programs. The performance in GATE exam of the students of respective colleges / institution will play a role in the rating of the institution. Similar exit tests would be good for students graduating in other disciplines under AICTE.

25.6 Exit test for Distance Education

It is proposed that there should be a mandatory exit test for all programs offered under distance education. This will ensure quality of those graduating under different distance education programs. For engineering it is proposed that the students should take the GATE exam. GATE today is well established, is offered online, and taken by nearly 8 to 9 lakh students. To facilitate taking of GATE as an exit test, once again, GATE should have multiple offerings in a year. As mentioned earlier for entry test, all one needs to do is create a huge bank of questions and this will then enable multiple offerings of GATE. For other disciplines under AICTE where degrees are being offered under distance education, similar exit tests may be developed by the National Testing Agency under AICTE.

Chapter 26

Distance education

We create our future, so if it is bad it is only our fault
Anatole France

26.1 Distance Education (DE) started long before Internet existed. But Internet is changing the definition of Distance Education and even threatening the mainstream university based education. One just cannot ignore DE. The Government has set up a Distance Education Council (DEC). The question is what role AICTE should play and what role should DEC play with respect to Technical Education. Also, what kinds of regulations are needed towards this?

26.2 **History**

The question of distance education in the field of technical education has been the subject matter of some debate. There is a Distance Education Council established under the IGNOU Act, 1985. Approvals are granted by a Joint Committee consisting of DEC-AICTE-UGC officials. Problems have been complicated in the past due to conflicting egos of the heads of these organizations.

26.3 The AICTE has been reluctant to approve technical education in the distance mode. This is because several open universities, private universities and deemed universities started awarding technical degrees and diplomas through distance education. Besides, several professional bodies conduct examinations which they claim to be equivalent. The entire system of technical education in distance mode has been vitiated by several players trying to create a value proposition for themselves. As it is, a million graduates pass out from the conventional system and enough employment opportunities do not exist for them. The AICTE does not wish to encourage the fly by night operators and let the quality deteriorate even further.

26.4 Looking at this situation, MHRD appointed the Madhav Menon Committee in 2013.The Committee recommended that any education can be taught through distance education mode.

26.5 Based on this report the AICTE appointed a Committee under the chairmanship of Prof. Anandakrishnan. The Committee suggested that a separate committee be set up

to consider distance education issues exclusively. Accordingly the Dhande Committee was set up. It noted in its Report that "in the absence of strict standards and quality of TE-BLM (Technical Education-Blended Learning Mode), there is a danger of ill-equipped graduates in engineering through distance mode occupying vastly expanding job market for teachers in engineering institutions, further eroding the quality of technical education through conventional mode as well."

26.6 The major recommendations of the Dhande Committee are:

- The first degree or diploma should be only through formal learning methods.
- Diploma holders with five years of experience should be admitted to engineering courses in distance/ hybrid/ blended mode of delivery leading to a Bachelor's in Engineering/ Technology. A National test be conducted for admitting students who are currently diploma holders. The examination be based on current curriculum and be credit-based.
- The second degree of a Master's in Engineering/ Management/ Computer Applications/ Hotel Management and Catering Technology can also be provided in distance/ hybrid/ blended mode of delivery. These need to be calibrated for Quality. Admission to all Master's programs should be through a common entrance test like GATE or CMAT.
- Whenever distance methodology is used, the practicals component shall be conducted in face to face mode.
- Ph.D. or fellowship program shall be offered through hybrid or blended mode with sufficient coursework and practical work. Such candidates should necessarily have related work experience in a registered company or industry for at least 10 years. Admission shall be by a common entrance test like GATE or CMAT.

26.7 Based on the above, AICTE issued a Regulatory Framework to conduct technical education in Blended Learning Mode in June 2013. This could not be implemented in 2014 due to litigation in the Supreme Court. In 2013, the DEC was abolished and its work taken over by the Distance Education Bureau of the UGC. This matter was considered by the Committee on Subordinate Legislation of the Rajya Sabha, which submitted its report on 18th December, 2014. It expressed its disapproval of the hasty manner in which the DEC was transferred to UGC through an administrative order in violation of statutory provisions of the IGNOU Act, 1985.

26.8 It should also be noted that the Indira Gandhi National Open University (IGNOU) has been implementing a meaningful technical education through distance mode for

decades. It has developed and followed a model for quality program delivery by establishing and following quality norms and standards for different programs. The curriculum and the self-learning material of IGNOU are designed and developed by eminent professors drawn from reputed institutions of India such as IITs, NITs and other premier institutions and industrial houses such as Gammons, Maruti, L&T, Hero, Motocorp etc. Care has been taken that the programs meet the standard norms for theory and practical components. In fact, the Self Learning material is the major part of cognitive learning and is similar to the lectures given by eminent teachers in conventional classrooms.

26.9 **Committee's Views**

The Committee recognises that it is important in today's world for those with technical and professional background, to continuously upgrade and refresh their knowledge. It is equally important for those who started work early and have not obtained even an undergraduate degree, to be able to upgrade their knowledge and qualifications while they are working. Distance Education is a vehicle to enable this; people who are employed could use DE to take courses and accumulate credits towards a degree.

26.10 It is important for regulators to ensure that such programs are indeed Quality programs, which help the DE student, rather than being programs run by fly-by-night operators, who offer poor-quality courses and provide meaningless degrees to gullible people in exchange of hefty fee. The **Committee feels** that **compulsory third-party rating** of all such DE programs (in line with ratings discussed in the chapter Estimating Quality of Technical Higher Educational Institute for the institutes offering in-person programs) and **an exit exam for all undergraduate program** be the vehicles to regulate such courses.

The **Committee is further of the view** that DEC should be an autonomous organisation for all distance education courses. However, for all courses leading to any degree in technical areas (listed in AICTE), it should be AICTE which should decide on the norms. As discussed above, all institutes / organisations which wish to award any technical higher education degree in distance mode must undergo rating for their distance education program. A new institute / organisation must get a minimum Greenfield rating for it to start a distance education program leading to a degree and maintain a minimum rating to continue the program. As long as ratings are good, the institute / organisation would be autonomous. An institute will however be allowed to start a post-graduate degree program in distance mode, only if the rating obtained is very high (as specified by an AICTE rating advisory Committee).

26.11 The Committee also believes that successfully passing in a national exit exam (same as or similar to GATE for engineering) conducted by IITs / IIMs or under the auspices of AICTE, should be the basis of every Distance Education undergraduate technical degree. Once this criterion is met, the degree must be recognised at par with other technical degrees in all aspects (including for higher studies and for employment in Government / non-Government organisation).

26.12 The next important aspect of a Distance Education Technical Program is with respect to practice / practical classes and experimental skills. The committee is of the view that Distance Education degree programs at undergraduate level should only be carried out preferably by part-time students, who are otherwise working (adult-learners). It is clear that such persons will benefit most from online and distance education, as they pursue it along with their work. The employment experience may to some extent count in lieu of some (but not all) practical classes. The students pursuing such a program should preferably be in continuous employment throughout their program. Further their employer must be involved on continuous basis (every semester) for evaluation of practical skills being acquired. On top of it, such distance education program should tie up with institutes in the locality of candidates to carry out Lab-work / presentation and quizzes at some weekends and evenings. The students who are not in continuous employment should go through a stronger practical program at a nearby institute.

26.13 The Committee recognises the importance of Distance Education for those pursuing part-time programs after graduation (continuing education). It is important in today's world for those with technical and professional background, to continuously upgrade and refresh their knowledge. There can be all kinds of certificate courses which are available on-line or through distance education mode. The Committee recommends that any institute / organization could offer such courses. Details of the courses must be available on a website and the certificates obtained by a candidate could be listed along with his / her marks and degrees in the on-line degree repositories discussed earlier.

26.14 The Committee further recommends that one could accumulate credits across institutions and across states as long as each of these institutions are authorised to carry out undergraduate or post-graduate program. The credits could be transferred and accumulated for a degree at any of the recognised institute / organisation.

Chapter 27

Industry-academia interaction

A bird doesn't sing because it has an answer. It sings because it has a song
Maya Angelou

27.1 One of the principal roles of technical institutes is to provide well-trained and educated students to Industry. It is therefore imperative that all institutes must involve industry considerably in guiding them. The involvement could be by placing capable industry personnel at the levels of Governing Board, Curriculum Committees and also in Advisory / Governing councils of Institute Incubators. Similarly it is highly desirable to have industry personnel deliver modules of courses, which would expose the students to the practical aspect of learning. Such modules could be of 5 to 8 hours duration and can be delivered by industry personnel either in person or by using live interactive video classes. Institutes should be encouraged to examine whether at least one such module could be included with every non-core course. Each of these activities, carried out well, should enable an institute to score points in their rating determination.

27.2 Ideally, all students of Technical programs should have at least one industrial training of two to three months duration. But with the number of Technical students now crossing 2.5 million per year, this may not be possible. Institutes should however continue to try to place their students for summer training. It should be noted that such summer training could be significant burden for an industry, unless the student is willing to be diligent and work hard. The experience is that many students in India, who are placed in industry for summer training, are not serious and carry out very little work. The industry then considers its effort to train these students a waste of time, and refrain from taking students as summer-interns in future. Institutes know of such a behaviour of their students, but often do nothing. In the process not only they, but all the institutes suffer. It is important that institute management as well as student interns consider the summer training as a great opportunity and ensure that the industry benefits (in however minor a way) from their presence and would be happy to take other interns in future.

27.3 What we have discussed so far under the industry-academic interaction, such interactions exist today but have limited success. While one should continue to make efforts in this direction, the Committee has come up with a new approach. Recognising that the faculty of these institutes, themselves have limited industry-exposure, the

Committee recommends that all permanent faculty members spend two months every alternate year working in an industry (or fully on an industry-sponsored project), at least five times in their career. Alternatively they can have less frequent, but longer stints in industry. This would give them an industry exposure, which they are highly likely to bring in to their teaching. At the same time, faculty with their breadth of experience, could occasionally come up with inputs for industry, which they may find valuable. Understanding the problems that the industries are facing, the faculty may at times be able to identify project ideas for students to work on, may be in collaboration with the industry. In the long run, the faculty can get sponsored / Consultancy projects from industry to work on. With some experience, it is possible that industry and academia bid together for research projects from different ministries. These teachers may even join faculty from premium institutes to create a consortium along with industry and participate in larger projects. This single act of getting all faculty to get some industrial exposure may start transforming the academia-industry relationship.

27.4 To enable faculty to take more interest in such industry-related activities, the **Committee recommends** that the faculty should get major share of consultancy / license fees / royalties accruing due to the products that they develop for industry.

Chapter 28

Management education

Lead from the back and let others believe they are in front
Nelson Mandela

28.1 This Chapter examines the special problems of management education. At present, the problems of this sector are not dealt with as a separate category, but it is rather subsumed as a subset of the general category of engineering and technology. This has created resentment in the minds of the promoters of management institutions.

28.2 During recent years there has been phenomenal increase in the number of institutions and intake in management education. Management cannot be compared to the branch specialisations in engineering like civil, mechanical, electrical engineering etc. Management itself has a large number of specialised areas of study. Besides, like the IIT's, the Indian Institutes of Management have also built a formidable reputation for the quality of students trained in them. At the very outset, the committee would like to clarify that all the suggestions made with reference to engineering and technology institutions apply with equal force to management institutions. All its recommendations on rating, accreditation, faculty enhancement, leveraging of ICT-based learning etc. apply with equal force to management institutions.

28.3 The stakeholders of this specialisation make some extreme demands .The most common demand is that there should be a separate All India Council of Management Education, distinct from the AICTE.

28.4 This demand has to be considered in the context of the National Policy on Education, 1986 as modified in 1992.The NPE elaborated on the role of the AICTE and clearly stated that it would be responsible for "ensuring the coordinated and integrated development of technical and management education".

28.5 The demand was considered by the U.R.Rao Committee in its 2003 Report. It concluded that "the constitution of a separate council would not be desirable. Close intrinsic interrelationship between management and engineering, particularly now that economic development is being driven more and more by technology and its successful management., would argue for keeping engineering and management

education under the same umbrella. Management education should, therefore, remain a part of the AICTE and a separate Management Council is not desirable. To the extent that management needs greater attention within AICTE, the Council should examine how this can be done so as to dispel the perception mentioned above"

28.6 One obvious solution is to create a separate Division to deal with issues related to management education within the AICTE.The reorganisation of the Council has been dealt with at length elsewhere. We have recommended that in the Mentoring and Development Wing of the reorganised AICTE, one division should deal with Engineering and Technology, while the other should deal with Management and Pharmacy. This recommendation should fulfil the aspirations of stakeholders from both these important segments of technical education.

28.7 There is a great need to look at the forecast of the supply of and demand for technical manpower on a short term and long term basis. It should look at the demand forecast at regional, All India and global levels. It should be possible for India to supply management specialists around the world. The data base created by the AICTE should be constantly analysed with the help of experts in business analytics, to evolve a policy framework at the national and state levels..

28.8 Currently an all India examination called CMAT is being held by the AICTE. This provides the merit list and facilitates admission to higher management institutions. Private Universities and deemed universities hold their own separate tests. Such a plethora of tests is neither desirable nor necessary. The CMAT should be declared as the only test mandated for admission to all management institutions.

28.9 In order to clearly demonstrate that the testing for admission is entirely independent of any outside influence, the admission test may be conducted by an autonomous National Testing Agency. It could be built upon that part of the CBSE which conducts such tests for all disciplines.

28.10 AICTE should relax regulatory norms for physical infrastructure by allowing multiple shifts in existing campuses and the use of online education within existing campus frameworks. The various norms for physical infrastructure are outdated and need to be revisited. For example, the high computer to student ratio should be reduced, taking into account the fact that most teachers and students own their own laptops.

28.11 At present there is a stipulation that educational institutions should be either registered societies or charitable trusts. They are not supposed to earn profits. This stems from the ancient Indian doctrine viz. "Education is that which liberates."

28.12 A suggestion has been made that the AICTE should create a mechanism to convert existing trusts and societies into Section 8 companies. This would give them greater transparency and flexibility while ensuring that profits, if any, are not distributed among members but are recycled within the institution. This seems to be a practical option.

28.13 Government should accelerate Foreign Contribution Regulation Act (FCRA) clearances to foreign investments/ donations into education.

28.14 In the revised scenario we are postulating, all the institutions shall be autonomous within a decade. Once academic and financial autonomy is earned by an institution, it would have complete freedom to charge any scale of fees. With profits being allowed, corporate investment in education will be attracted. It is clear that such freedom would be accompanied by a reasonable percentage of freeships to pursue an inclusive agenda. This percentage may be mandated under the relevant Regulations.

28.15 AICTE should freely allow dual degrees and other academic partnerships with any foreign or domestic university without insisting on such collaborations being confined to the top 500 universities alone. At best it may be stipulated that the collaborating universities should be accredited by an approved accreditation agency like ABET.

28.16 Education is a concurrent subject. With the initiation of RUSA and the setting up of technological universities in every State, the focus of responsibility has moved significantly towards the State Governments. AICTE should draft their services in every way and also give the States representation on their consultative mechanisms.

28.17 AICTE should clearly acknowledge that its major responsibility is the plethora of affiliated colleges in non-metropolitan areas which suffer from all kinds of problems. They lack qualified and competent faculty. Their graduates are barely employable. Affiliated colleges should be encouraged to become PGDM schools. For purposes of grants-in-aid, private and Government colleges should be treated at par.

28.18 AICTE should identify sufficient number of eminent academicians for nomination on the governing bodies of institutions. They will ensure ethical governance and help the boards to tone up their academic standards. The attempt should be to guide and mentor the institutions to improve their performance.

28.19 There should be at least 25 National Centres of Excellence. The selection should be made primarily on the basis of research journal publications and Ph.D. programmes. Certain themes that need special study in the Indian context in the next five to ten years should be identified and scholars invited to undertake research on those themes

either as part of an institution or as individuals. The country must produce at least 6000 Ph.D.'s and Fellows in Management every year. Industry must consider funding research chairs, projects and centres as part of their Corporate Social Responsibility.

28.20 There should be a cognate concept of Academic Social Responsibility on the higher management institutions. They should volunteer to adopt a certain number of sub-standard institutions for all round mentoring and development so as to bring them up to the mark.

28.21 It is a mistake to presume that only persons with teaching experience would be suitable for appointment in the AICTE. Some of the posts would require persons having professional qualifications and experience of educational planning and institution building. Specialist positions such as strategic planners, financial controllers, IT heads, HR managers etc. should be recruited directly from the open market.

Chapter 29

Vocational education

> Education is not preparation for life. Education is life itself
> *John Dewey*

29.1 In this chapter, we consider the initiatives being taken in the country in the field of vocational education and the manner in which the National Skill Qualification Framework (NSQF) has already introduced a seamless system for credit transfer across educational and training systems. The NSQF represents a major initiative for introduction of flexibility and manoeuvrability in the Indian systems. It has valuable lessons for the larger universe of both general and technical education.

29.2 The world (both developed and developing economies) is experiencing an ever widening gap between the demand and supply of skilled manpower. The world's population is growing old. By 2050, the number of people above 60 years will hit the 1.3 billion mark. This trend will lead to a widening of the demand-supply gap, especially in developed nations like USA, Germany and France. On the other hand, India is emerging with one of the youngest populations in the world. It is estimated that by 2022, India will face a demand for 500 million skilled workers. Training such a vast human resource will help in realization of the *"Make in India"* aspiration.

29.3 Improved training and skill development is critical for providing opportunities to the growing youth population and necessary to sustain the high growth momentum. Although institutional structure is in place, there is still a long way to go. The dilemma is also in terms of social perceptions. Skill training does not accord social status to the youth, whereas degree and diploma holders join the vast army of the educated unemployed.

29.4 The challenge is mainstreaming of skill formation inside the formal educational system right from school, while skill creation outside the formal system also needs coordinated action and innovative approach.

Prevailing skill development systems in India

29.5 **Community College System**

Community Colleges were first conceived of in India by the young scientists and

educational entrepreneurs Dr. Priya Ranjan Trivedi and Dr. Uttam Kumar Singh in the year 1985, when the then Ministry of Welfare, Government of India allocated funds under the Special Component Plan specially for the training of scheduled caste communities. Accordingly, the first Community College was established at Mandar Vidyapith in the foothills of Mandar Parvat in Bihar . The funds of the Central Government were routed through the State Department of Industries for the establishment of training cum production cum rehabilitation centres

29.6 The Community College Movement started in South India in October 1995 with the beginning of the Pondicherry University Community College. It spread to Andhra Pradesh with the starting of JMJ Community College at Tenali in July 1999.

29.7 The Indian Centre for Research and Development of Community Education (ICRDCE), Chennai is an initiative of Jesuit Madurai Province and a unit of the Chennai Jesuit Society, Chennai Mission, Chennai. It was started in January 1999. It is involved in establishment, monitoring and evaluation of Community Colleges in different States of India. ICRDC awards its own Diploma which is of two years' duration.

IGNOU Community College:

29.8 The Indira Gandhi National Open University (IGNOU) community college scheme was started in 2009 and was meant primarily for the underprivileged sections of society. Under this scheme, a community college could register for offering academic programmes at the levels of certificate, diploma and associate degree. After successfully completing the study through this scheme, a student was certified by IGNOU. IGNOU Community Colleges had a 2-year curriculum that either led to an Associate degree for transfer to an undergraduate college or to the job market.

29.9 IGNOU decided to stop the scheme completely based on non-performance of these colleges. The university had close to 620 community colleges, which enrolled more than 80,000 students.

The Lateral Entry Model:

29.10 Several institutions in India like Dayalbagh Education Institute (DEI), Sant Longowal Institute of Engineering & Technology (SLIET) etc. are imparting the skill training with option of vertical mobility into the higher education segment. Students admitted to ITIs in these institutes are later admitted to the Diploma program and then to Engineering Graduation Program through lateral entry.

Community Development Through Polytechnics (CDTP)

29.11 The main objectives of this MHRD scheme are:

- to carry out need assessment surveys to assess the technology and training needs;
- to impart skill development training to the intended target groups;
- to disseminate appropriate technologies for productivity enhancement;
- to provide technical and support services to rural masses and slums dwellers;
- to create awareness among the target groups about technological advancement and contemporary issues of importance

Industrial Training Institutes (ITIs):

29.12 A large part of the current vocational training infrastructure is located in the Government and private ITIs which fall under the Ministry of Labour and Employment, Directorate General of Employment and Training (DGET). The National Council of Vocational Training (NCVT) plays a key role in the formation of training curriculum, policies, standards, as well as in certification by means of the 'trade test'.

National Skill Development Corporation (NSDC):

29.13 The National Skill Development Corporation (NSDC) has been set up under Public-Private- Partnership (PPP) mode as a Section-25 Company under the Ministry of Finance to provide viability gap funding and coordinate private sector initiatives.

29.14 One of the roles of NSDC is to create Sector Skill Councils. Till date, the NSDC Board has approved 18 SSC proposals which cater to the requirements of 18 identified high growth sectors ranging all the way from agriculture to construction, and from healthcare and banking, financial services and insurance (BFSI) to IT/ITeS and retail. A further six SSC proposals are currently undergoing due diligence and an additional eight proposals are in the pipeline.

29.15 The SSCs approved by NSDC are presently in various stages of developing skill competency and occupational standards, as well as engaged in standardizing the affiliation and accreditation processes. Many of them are in the process of setting up labour market information systems (LMIS) to assist in the planning and delivery of training, besides identifying skill development needs and preparing a catalogue of skill types.

29.16 Four SSCs – for the auto, IT/ITeS, retail and private security – are involved with the pilot project of the National Vocational Education Qualification Framework (NVEQF)/NSQF, as part of which vocational courses in auto, IT/ITeS, retail and private security have been introduced in classes IX to XII across 40 schools in Haryana.

Limitations of existing system:

29.17 The Skill programs offered by ITI, Vocational Higher Secondary Schools, Apprentice Training Schemes, Modular Employable Skill of Ministry of labour, through various NGOs, Krishi Vigyan Kendras etc. suffer from poor infrastructure, absence of qualified staff and obsolescence.

29.18 The Vocational education programs carry a low esteem being a second priority choice among parents and students as the skills provided by these institutions are terminal in nature. A student being trained as a mechanic ends up as a mechanic only for his whole life.

29.19 Most of these programs are short duration not leading to any vertical mobility. Further, most of the courses are labour market oriented with very limited space for aspirations to move on vertical ladder.

29.20 Students pursuing the skill development program are not getting enough opportunities for admissions in higher education, for example - students certified by ITIs are not being considered eligible for admissions to the Degree level programmes. Similarly, Certificate/Diploma programme issued by Community College like ICRDCE) are not approved by statutory bodies like Universities or Boards of Technical Education, thus restricting the mobility of students.

29.21 The IGNOU Community Colleges were offering Associate Degrees as is being done by the American Community Colleges but most of the Indian Universities are not allowing admissions to such students who have a 2- year associate degree in the 3rd year of their Under Graduate Programmes.

29.22 Even if the student is willing only to imbibe the skills and is not an aspirant for higher education, most of these institutes are not linked to industries through apprenticeship and similar schemes. As such, the trainees are not industry ready and do not secure ready employment.

Integration of skill programmes with higher education

29.23 The need of the hour is the integration of Skill Development programmes with higher education and its blending with industries through programmes like Apprentice training or other similar models.

Apprenticeship model

29.24 India has only 4.9 lakh apprentices in comparison to 1 crore in Japan and 2 crore in China. India has only one apprentice per 1000 jobs, while Australia, Austria, England, France, Germany, Ireland and Switzerland have 39, 33, 11, 17, 40, 11 and 43 respectively.

29.25 The Apprenticeship model as a mode of skill development has been in existence right from the Middle Ages and it constitutes the 'school to work' component for employability improvement. In recent times, apprenticeship training has been tried in Europe and USA. The need for apprenticeship as one of the curricular inputs was felt globally during the second half of 20th century, which brought in significant changes in political, economic and educational environments. One of the successful models of integration of education with Skills is Germany's Dual Education System.

29.26 About 1.6 million German youth enter into an apprenticeship program each year. More than 75% of Germans younger than 22 years of age attend an apprenticeship program . Of these, about 60% complete the program before taking up long term employment or proceeding for further education. Finding a job without having completed an apprenticeship is almost impossible. The private sector and the Government have built a very strong partnership to achieve this.

29.27 The German model is called the dual education system and is followed in several other countries such as Austria, Switzerland, Denmark, Netherlands, France, and for some years now in China. The dual system combines apprenticeship in a company and vocational education at a vocational school.

29.28 As one part of the dual education course, students are trained in a company for three to five days a week. The company is responsible for ensuring that students get the standard quantity and quality of training set down in the training descriptions for each trade.

29.29 The other part of the dual education course involves lessons at a vocational school (Berufsschule), The responsibility for this part of the course lies with the school authorities in every German state.

National Skill Qualification Framework (NSQF) –

29.30 In September 2012, the Ministry of Human Resource Development, Government of India, notified the National Vocational Education Qualification Framework (NVEQF), a descriptive framework that organizes qualifications according to a series of levels of knowledge along with skills.

29.31 In pursuance of the decision of the Cabinet Committee on Skill Development in its meeting held on 19th December 2013, Ministry of Finance vide notification No. 8/6/2013-Invt. dated 27th December 2013 notified the National Skill Qualification Framework (NSQF). As per the notification all other frameworks including NVEQF would cease to exist and will be superseded by NSQF.

29.32 NSQF is a nationally integrated education and competency based skill framework that provides for multiple pathways both within vocational education and between general and vocational education to link one level of learning to another higher level and enable learners to progress to higher levels from any starting point in the education and/or skill system.

29.33 The NSQF is being implemented through the Community Colleges, set up by Government of India on pilot basis, AICTE approved Technical Institutes, UGC approved Institutes etc.

29.34 *Objectives*

- Bridge skill gap and provide trained manpower to various emerging sectors in India.
- Prepare the youth for a vocation of their choice.
- Build a formidable work force of international quality for Demand not only in India but also in other countries.
- Reduce unemployment by supplying world-class skilled manpower.
- Reduce cost and improve productivity of services and manufacturing by providing skilled manpower to international standards.

29.35 **Operational Methodology: Integrating VE with & Conventional Education**

- Skill Knowledge Providers / Trainers (SKP) to be registered by AICTE or other authorised bodies for imparting specific skills.
- A student registers with an AICTE approved Technical Institute or any other college for a Vocational Diploma or a Vocational Degree or registers with any other Institute affiliated to any Technical Board or a University.
- The student completes the skill modules as required at various certification levels, one level at a time, acquires the necessary credits from the Skill Knowledge Provider/Trainers (SKP), and gives them on to the Institute where he is registered for a Diploma, Post Diploma or a Degree or a PG Degree.

- These credits are transferred to the Technical Board or the University as the case may be, which compiles the Vocational Skill credits and the formal education credits and if all such credits are available as required by the certification level, then the Technical Board or the University shall award the certification at that level.
- Certification levels as required will entitle the student for the award of a Vocational Degree or a Vocational Diploma or a Vocational Post Diploma or a Vocational Post Graduate Degree.
- The candidates may enter the job market after each certification level or may continue to acquire additional credits in part time / full time mode in order to complete the requirements of Vocational Diploma, Post Diploma or a Vocational Degree or a Vocational PG Degree.
- For first seven certification levels 'Knowledge and Skill' have been identified. First two levels refer to standard IX and X at school level. These shall be with the CBSE schools or schools affiliated to State Boards and equivalent other boards.
- Each level requires about 1000 hours of education and training per annum. For the vocational stream leading to a Degree or a Diploma or a Post Diploma, these hours shall have both vocational and academic component. The vocational component will go on increasing as the level of certification increases. The Skill modules or the Vocational content at a certification level could be a single skill or a group of skills of the number of hours prescribed.
- A candidate shall have freedom to choose either a vocational stream or a conventional stream to reach graduation level. In addition, a candidate shall have freedom to move from vocational stream to current formal higher education stream or vice versa at various stages. This multi level entry and exit system shall allow the candidate to seek employment after any level and rejoin the education as and when feasible to upgrade qualifications / skill competency.
- A student entering a Vocational stream from general stream can enter at a certain level provided the skills required at that level are acquired, from a registered SKP.
- A student who has acquired the skills through work experience, can also enter the Vocational stream at an appropriate level provided he is assessed for the skills acquired from a registered SKP, which is Recognition of Prior Learning (RPL)

29.37 **Conclusion:**

The central government is now fully geared to an integration of vocational education,

industrial training and higher education, with the system of transfer of credits fully in place. Thirty Ministries of the Government of India are engaged in the massive task of imparting job-oriented skills to the youth. The entire effort is coordinated by the newly created Ministry of Skill Development and Entrepreneurship.

29.38 The AICTE is fully involved in this national endeavour.The Committee commends this laudable initiative taken by the Government. Various stakeholders, especially students and young faculty pleaded for a sea change in the way the educational system is structured in this country. Even today most educational institutions put the student in a unique educational stream, where there is little scope for manouvring.

All the components of the educational system should learn from the NSQF model and adapt it in all parts of the educational process. There should be scope for shifting in midstream from one subject area to another or have a mix of subjects taken from various disciplines. We are hopeful that if our recommendation for giving autonomy to technical education institutes is implemented, this process of evolving a flexible learning process will come into being very soon.

Part VII : DEFINING THE TERRITORIES

All creatures have a sense of territory, except children

- P.K.Shaw

Chapter 30

AICTE and UGC

30.1 **Handling conflicts and overlapping roles**

The committee notes that there is a considerable overlap between roles of various bodies, which sometime leads to contradictory policies and conflicts. It is important that clear separation of roles and responsibilities is required to avoid this. In this chapter, we discuss the roles of AICTE and UGC.

30.2 **AICTE:** AICTE should be an autonomous body to regulate and support all technical higher educational Institutions including all the technical institutions affiliated to any university. It should also regulate and support all technical programs in any university. However, the technical institutions of national importance declared as independent by an Act of Parliament are not to be regulated or supported by AICTE. MHRD (Higher Education) provides the funding to AICTE. MHRD could also provide some general guidelines from time to time and get the functioning of AICTE evaluated periodically. Many of the support roles recommended in this report for AICTE would need assistance from MHRD. MHRD's programs in this direction should be closely coordinated with that of AICTE.

30.3 **UGC:** While AICTE should regulate all Technical Education, including such programs associated with universities and affiliated institutes, UGC could continue to be the regulator for all other higher educational program. UGC should have no role for Technical Educational programs anywhere.

30.4 The ACTs and Statutes of AICTE and UGC would need amendment to delineate the roles. Some suggestions are given in Appendix B, C and D.

Chapter 31

AICTE and subject-matter councils

31.1 Professional councils like Pharmacy council of India, Council of Architecture and others in the area of Technical Higher Education are important bodies overseeing specific professions. These professional councils should recommend Curriculum, the way of conducting education and the kind of professional practices that need to be carried out before the degree is awarded. AICTE must take these inputs in formulating their policies and practices. For example, if one of the councils believe that the program should not be offered by any institute in multiple shifts, the AICTE will place the matter before their respective Board of Studies, to take the final view on the matter. However it is AICTE, which would be the regulator for all technical institutions, including in the subject areas where professional councils exist. As discussed in the report, AICTE will mentor, support and advise these institutions.

31.2 However, once AICTE declares the technical institutions as autonomous, based on their ratings and accreditation, AICTE will only provide advisories. The compliance or non-compliance of these recommendations of AICTE should impact the rating of the institute. It is recommended that the rating agencies may take appropriate inputs from these professional councils in deciding its rating methodology.

Chapter 32

Role of state governments

A nation of sheep will beget a government of wolves
- Edward R. Murrow

32.1 In 1976, the Constitution of India was amended to place "education" in the Concurrent List. This made the Centre and the States equal partners in the promotion of education.

32.2 Currently the States play an important role in the management of technical education. Organisationally, there is a Secretary, Technical Education in the State secretariat to deal with policy issues, a Directorate of Technical Education to manage the institutional infrastructure and a Technical University to provide academic supervision and leadership.

32.3 Over the years, the AICTE has developed contacts with the State setups. It has been requesting the States to collect and supply data on demand for and supply of different categories of technical manpower, but the States do not have the necessary staff, resources and expertise to provide this logistic support.

32.4 Some State Secretaries who appeared in person before the Committee complained that the Council no longer asked them to provide a No Objection Certificate before processing the request for a new institution, a new course of study or increase in the number of seats in particular disciplines. Other States admitted that such NOC was part of the prescribed drill, but `had a grievance that the Council did not wait for their comments.

32.5 There is no doubt a certain advantage in insisting on an NOC from the State Governments. But some stakeholders think of this clearance as imposition of one more hurdle in the path of educational entrepreneurs. The States have to prove by their conduct that they are fully wedded to the concept of autonomy of educational institutions and would work assiduously for the same.

32.6 As the technical education policies would form an integral part of the Skill India Initiative of the present Government at the Centre, the State Governments would have to cooperate with the centre's initiative in the following manner:

i) The State Governments should devise suitable policies to ensure that universalization of elementary education is achieved at the earliest.

ii) There should be universal literacy as soon as possible.

iii) The programmes of vocational education, vocational training and technical education should be operationalized in a coordinated and integrated manner.

iv) There should be only one Technological University in each State. Even this will gradually cease to be an affiliating mechanism and concentrate on being part of the mentoring and development initiatives of the AICTE.

v) The State Governments should collect data on the possibilities of newly emerging technologies, potential investments in industry and commerce, demand for various categories of manpower, figures of employment and unemployment and so on. They should supply the data promptly to the AICTE and the rating agencies. In fact, the States should bring out an annual publication giving all this data and keeping it in the public domain.

vi) They should assist the AICTE and its regional offices in mentoring and developing the sub-standard institutions, so as to guide these towards autonomy.

32.7 Departments of Technical Education (DTE) at State Level could evaluate the demand of Technical Education in its state and make it available to rating agencies for rating Greenfield Institutes. It could coordinate with AICTE for any support role that it wishes to provide to the technical Institutes. As the approach is to make all the institutes autonomous in a progressive manner, based on ratings and Accreditation, the States would do well to collaborate in this national endeavour and make autonomy a reality as soon as possible.

32.8 A newly proposed technical institution will require land and environment clearance from the State Government agencies before it applies for Greenfield rating. The committee recommends that states have a single window clearance for land and environment. Having got these clearances, the proposed institution will have to get Greenfield rated by one of the empanelled rating agencies and obtain a certain score to start functioning. Based on the rating obtained, they would get permissions from AICTE to start. No other clearance from State Government or DTE should be required beyond that. **The committee recommends** that no further NOC should be needed from State Government or DTE and any such requirement should be done away with.

32.9 Most State Governments run one or more public technical institution in their state. One of the prime task of the State Governments and DTE should be to ensure that these institutions are run well and get highest rating in the state. Towards this, they need to ensure that finances of these institutions are healthy and they are not denied money for any legitimate expenditure to enhance quality. Further the Board of Governors and the Director of the institute should get financial autonomy and suitable financial powers. State Governments have traditionally built the infrastructure and provide support towards salaries of faculty and staff. Besides this, in most states, very little is provided towards operation expenditure and for renewal of infrastructure. The student fees is pegged by the Government to be quite low and all the fee amount collected is subtracted from the total amount received by the institute from the Government. The low fee amounts are justified in terms of needy and poor students. The problem is that the institutions are starved of funds required to pursue quality and keep infrastructure in a decent state. The **Committee recommends** that the finances of these institutes must be fixed. One approach could be to enhance fees to some extent, coupled with scholarships for needy students and let the institutes keep the fees collected.

However, it is not just the finances that have been the cause of many of these state Government technical institutions not doing as well as they did in past. Leadership and faculty quality has often been weak. It is the responsibility of the State Government and DTEs to ensure these institutions become the best.

32.10 Thus the State Governments would need to facilitate the onset of autonomy within the technical education system and collaborate in the liberation of Saraswati from the stranglehold of controls.

Chapter 33

Role of universities offering technical educattion

33.1 **Introduction:** Universities have historically played a significant role in imparting technical education. Several of these universities have had high quality technical programs for a long time and trained the best technical students, both at undergraduate as well as the Masters level at the time of independence. In early and late 50's IITs started offering engineering programs. Later IIMs and RECs came in. They slowly started taking leadership in technical education. In mid-80s, when Self-financed Institutions (SFIs) started to offer technical education, they were affiliated to universities. As number of students in affiliated in technical colleges increased and crossed the numbers taught directly by the universities at undergraduate level, the focus of many of these universities shifted to managing the quality of affiliated colleges. In fact some new technical universities were set up to manage the increasing number of affiliated SFIs. They lost of many of their senior teachers to the new SFIs and their research programs suffered. At the same time, as the number of qualified teachers in the affiliated colleges increased manifold, their capacity to offer research and cosultancy work increased, but it large remained unutilized.. However a few universities retained their thrust in research and technical education.

33.2 **Regulatory role:** For colleges, this committee recommends graded autonomy culminating in full autonomy. Till full autonomy is achieved, the affiliation will remain with the technical universities and will be solely under the purview of AICTE. All technical programs of these universities have to be rated by one of the empanelled agencies. They need to earn certain grades to run their graduate programs, as discussed in earlier chapters.

Today most of the technical institutions in the country are affiliated to one of these Universities. The committee recommends that these institutions must get a certain rating and become autonomous within ten years, failing which they need to be merged with institutions with higher rating. In ten years, the affiliation system of universities will stop functioning, when the affiliated colleges are able to offer very high quality of education.

33.3 **Model Institutes:** The committee further recommends that universities offering technical program at their constituent colleges or in the universities own department

should work to see that these technical programs should be high quality serving as an inspiration to other technical institutions, and serve as examples from which the other institutions could learn. They should exemplify autonomy, innovations in academics and dynamism in their curriculum. Their undergraduate program should be of the highest quality and they should strive to get the highest rating from one of empanelled rating agencies.

33.4 **Graduate Program:** The technical universities should not only get the rating to offer the graduate programs, but should have one of the finest graduate programs. Their R&D should be of high quality and should be respected inside and outside the country. They could spend efforts to understand the technology needs of the state and provide a vision for the development of industry in that state. It would be expected every technical university will get adequate financial resources to sustain high quality programs.

33.5 The technical Universities should attempt to become centres of knowledge dissemination, should coordinate seminars and conferences to enhance technical education throughout the state. They should set up closer connectivity with industries, and improve practice orientation in technological education. A technical University should set up committees consisting of Principals of Colleges and leaders of industries, with the following objectives:

(i) To base Final Year projects on the problems of the industries

(ii) To have a regular flow of professionals to the class-rooms

(iii) To organize regular visits of students to industries, but with a clear objective like studying the issue of energy conservation in industry, or the issue of pollution and its solutions, studies in various areas like better governance, compliance requirements, CSR Clinics for SMEs etc.

(iv) To invite some persons with an aptitude for such work to be guest lecturers.

As a result of such efforts, in a leading technical university, for three consecutive years the number of Final Year projects, based on industry problems, has remained at about 70%. A second technical university is trying to replicate the model. All technical institutes could learn from such examples.

33.6 **Designing Question Papers to eliminate Rote-Learning:** To force a student to sit through a class which he does not like, is not going to help the cause of good learning. *Exam-oriented teaching, use of Guidebooks and rote-learning* have been the bane of higher education in India. However the change in the deep-seated convention would require the use of experts in education, change in the way teaching takes place and

transformation of the process of teaching and setting up question-papers. Technical Universities should take a lead in this direction.

33.7 **Practice-Orientation and Skill Development:** Universities need to take lead in emphasising the importance of practical work for the students. To make the practical work more interesting students in groups could be asked to design their own practicals to prove some concept; this could ensure that the practical work does not remain a meaningless meter-reading and graph-drawing exercise. Research work of the Faculty Members and research scholars should be relevant to the needs of the society and the SMEs. Evaluation of Master's theses by industry in addition to evaluation by faculty could also enhance progressively the relevance of the research work to the needs of the industry.

33.8 **Working for Transforming Education:** A Technical University could take lead in transforming technical education. It could take a lead in designing a start-up policy so that students even in rural areas could benefit and develop technology enterprises. It can help develop a culture of innovation by making the study of patents in areas related to the project work compulsory. It can set up State-of-Art Workshops to keep technical education highly contemporary. It can create Centers of Excellence to make available world-class laboratories for common use by students and researchers. For example, today one of the technical universities is setting up a research lab in Pharmacy at a cost of Rs 120 crores. A university could take lead in exploring innovative models for Higher Education. As an example, a technical University has started a study of the history of India's higher educational system since 1857 and the requirements of the structure of a University in India through its Center for Technology Education, Public Policy and Universities of the 21st Century.

33.9 **Developing a close connectivity with the Society:** A technical University should take a lead in promoting closer connectivity with the society through

(i) Final Year projects based on solution of social problems. A technical University has re-imagined and re-designed the infrastructure of 494 villages and many villages have started implementing the designs. The University promotes the activity by giving a small scholarship to the teachers and students working on such projects

(ii) offering technical expertise for slum removal/ up-gradation studies, for solid waste management, for rain water harvesting studies, for use of green building concepts in public buildings and various other projects relevant to urban and rural needs.

(iii) studies in governance issues for Governmental organizations, public and private organiztions.

33.10 Another role of the University is to build a high morale among all the stake-holders so that they begin taking pride in their association with the University. This can motivate them to work hard in their studies and to take full advantage of University life by participating in the University's co-curricular activities (like workshops/ short-term courses, seminars/ conferences on areas of their interest and Technology clubs like Open Source Technology Clubs, Mobile & Wireless Technologies Clubs etc.) and extra-curricular activities like Sports, Youth and Tech-Fests. The Universities are required to inspire confidence in the value of its education even while they continue to work tirelessly for improvement in the quality of education. Moreover, in the long run, having participated in the above mentioned programs at the technical university, the local institutions should be encouraged to start similar programs of their own however they should encourage students of the other nearby colleges to participate. This will create a dissemination of events. Also, then these events could be made more relevant to local needs.

33.11 **Conclusion:** The entire thrust of our report is to create an atmosphere of autonomy in the country to enable high education in the country:

(i) At the apex would be the reconstituted AICTE with a constitutional status and wholly autonomous in its functioning, with the primary function of mentoring the rest of the system to move towards quality, excellence and leadership.

(ii) In this task the institutes of national importance will be the prime movers. They will provide the guidance, leadership and dynamism. Their faculty will be at the forefront of the drive towards India becoming a technical education superpower.

(iii) Technical universities should strive as the state level dynamos charging the entire operation. Although they may lose their role as affiliating universities, they can become model institutions for the rest to emulate.

(iv) Last but not the least would be the individual autonomous institutes. Many of them will be SFIs. Some of them could become amongst the best undergraduate institutes. Some others may become R&D institutes. Yet others may focus on providing high quality consultancy to industries.

Part VIII : CONSEQUENTIAL CHANGES

Be the change you want to see in the world
– Mahatma Gandhi

Chapter 34

Re-engineering the structure

> The task of the modern educator is not to cut down jungles, but to irrigate deserts.
> *C.S.Lewis*

34.1 Having outlined the vision for the future and the change in the strategy let us now consider the structure of the organisation that will be best suited to implement the change.

History of manpower deployment in the AICTE

34.2 Historically, the AICTE started as an advisory non-statutory body. The Government of India passed a resolution constituting the AICTE on November 30, 1945. At first the Council consisted of the representatives of the Ministries of Education, Labour, Industry and Commerce, the Inter-University Board, the Central Advisory Board of Education, the Association of the Principals of Technical Institutions, the Institution of Engineers, the Indian Legislature and the provincial governments.

34.3 The AICTE was set up as a statutory body in 1987. Till 1993, the HRD Minister functioned as the Chairman of the Council,, the Minister of State HRD was the Vice Chairman and the Additional Secretary (T) in the Ministry was the Member Secretary. From 1988 to 1993, the Council functioned as part of the MHRD, Government of India. A Joint Secretary (Technical), a Deputy Secretary (Technical) and a Deputy Secretary (General) were on deputation to the Council. Two Under Secretaries (Technical) and 13 supporting staff were taken on direct recruitment.

34.4 It is this long and intimate relationship lasting 47 years from 1946 till 1993 that has made the AICTE a kind of appendage of the MHRD.

34.5 For the first time in 1993, a full time Chairman, Vice Chairman and Member Secretary were appointed on tenure basis. Regular staff structure was created on 6-12-1993. Unfortunately from 1993 till 2005 all Group A posts were appointed on deputation/ contract basis. Even the supporting staff of 40 Data Entry Operators was appointed on contract. Till date, the Council has been running on borrowed staff.

34.6 In 2005, the Staff Inspection Unit was asked to conduct a manpower assessment study. They sanctioned 206 posts at AICTE Headquarters. However, only 2 officers and a

handful of supporting staff were appointed on permanent basis in 1991 and 3 officers, who were on deputation and subsequently absorbed in 1996, were in the regular service of AICTE.

34.7 The Government of India considered the report of the Staff Inspection Unit and sanctioned 209 posts for the Council. Recruitment Rules for these posts were notified in 2007.The SIU Report was, however, not implemented. Government had sanctioned 209 permanent posts in Group A, B and C categories. Only Group D posts were to be engaged through outsourcing.

34.8 However, the AICTE did not fill the posts as per the recruitment rules, but kept on engaging officers and staff on deputation, contract and daily wages at all levels. At present 4 posts of Deputy Directors, 15 posts of Assistant Directors, 1 post of Assistant Legal Officer, and group A posts which had to be filled up on direct recruitment basis have been kept vacant. 56 posts of Data Entry Officers, Legal officer, Computer System Assistant, Accountants and assistants, stenographers, LDCs, UDCs and receptionists in Groups B and C have also been kept vacant. Nearly all the officers at Headquarters and regional offices are temporarily on deputation and most of the staff have been engaged through outsourcing.

The New Dispensation:

34.9 If the AICTE is to have a manpower framework suited to its new role as an apex autonomous institution in the country, its entire framework has got to be reinvented. Let us examine its top policy forums first.

The Council:

34.10 At present the highest policy making forum of the Council is mentioned in Section 3 of the AICTE Act, 1987. It has 51 members, most of whom are appointed by the Central Government, which in effect means that they are all nominees of the Ministry of Human Resource Development. It is an unwieldy body and most members are either too senior to attend the meetings of the Council themselves or have little stake in the goings on.

34.11 The Review Committee considered the matter and after careful consideration suggests the following composition for the Council:

1. Chairman
2. Vice-Chairman
3. Member Secretary

4. Secretary HRD or Additional Secretary (Technical Education) MHRD
5. Two chairmen of Regional Committees
6. Two Secretaries (TE) of State Govts by rotation
7. Two Vice Chancellors of State Technological Universities by rotation
8. One Director IIT, by rotation
9. One Director IIM, by rotation
10. Two representatives of Industry associations to be nominated by the major associations(ASSOCHAM, CII, FICCI and NASSCOM) by rotation
11. One representative from each of the subject matter Councils
12. Chairman, UGC and Chairman DEC
10. One representative each of private engineering colleges and Management schools , out of the associations recognised in this behalf, by rotation
11. A representative of the Ministry of Finance, Government of India
12. One representative of a Ministry using technical manpower, by rotation.
13. Chairmen of the Boards of Studies
14. Secretary, DST or his representative.
15. 5 eminent experts in engineering, management, pharmacy, architecture or catering technology.

Executive Committee

34.12 Similarly the Executive Committee needs to be reconstituted as under:

1. Chairman
2. Vice Chairman
3. Member Secretary
4. Additional Secretary(Technical Education) in the MHRD
5. Financial Adviser, MHRD
6. One State Secretary (Technical Education)
7. One Vice Chancellor, State Technological University

8. One Chairman Regional Committee
9. One Chairman, Board of studies
10. One representative of the Private engineering/management colleges
11. One representative of Industry
12. Two experts in teaching and research in any of the specialisations of AICTE

The top leadership:

34.13 The top leadership currently consists of the Chairman, Vice-chairman and Member Secretary. About the chairman we have given detailed recommendations in another chapter. We have suggested that a similar exercise be conducted for the other two posts also.

Organisational Structure:

34.13 About the structure of the organisation, it is felt that the work should be divided into three broad categories as under:

I. The Headquarters Organisation

II. The Autonomous Agencies

III. The Regional Chapters.

Let us take these one by one.

The Headquarters Organisation

34.14 This should be divided into three major segments:

Mentoring and Development Wing

Regulation Wing

Administration and Coordination Wing

Mentoring and Development Wing

34.15 This will be the major activity of the Council. It should be divided into three Divisions:

Division A: Engineering and Technology Division: This Division shall cover Engineering, Technology, Architecture, Town and Country Planning and Information Technology.

Division B: Management and Pharmacy Division, which will cover Management, Hotel

Management and Catering Technology , Pharmacy, applied arts and crafts etc.

Division C: Financial Assistance Division. This Division will release plan assistance to the institutions

34.16 The following activities will be covered by Divisions A and B:

- o Guidance for better governance
- o Research
- o Faculty improvement
- o Blended learning
- o Infrastructure
- o Startups and patenting

34.17 Division C will look after the following items of activity:

- o Manpower planning
- o Surveys and statistics
- o Sanction of grants to individuals and institutions

Regulation Wing

34.19 This will be an activity geared towards grant of approval to Greenfield institutions, extension and increased intake in brownfield institutions, empanelment of third party rating agencies, issue of guidelines on rating procedures and norms, and related matters

Administration and Coordination Wing:

34.20 This Wing shall be divided into the following Divisions:

Finance Division

Administration Division

Vigilance Division

Legal Division

The Cognate Autonomous Agencies

34.21 The second major part of the AICTE shall be the cognate autonomous agencies reporting to it. There shall be the following three agencies and one National Centre to start with.

National Testing Agency

34.22 We have suggested that entry into a technical education institution should be regulated by holding of single nationwide test for each major branch of specialisation: the JEE for engineering courses , the CMAT for management courses and so on. These should be held by a National Testing Agency, so that the examinations are held in a transparent manner and there is no scope for manouvering.No other tests should be permitted in the country.

National rating Agency

34.23 We have separately dilated on the use of rating by third party agencies as the fulcrum of regulation. The agencies have to be defined, empanelled and monitored. Their empanelment is bound to throw up numerous points for adjudication and decision. It may be necessary to create grievance redressal mechanisms to meet the concerns of those adversely affected. Appellate procedures would also have to be evolved.

34.24 **National Board of Accreditation:** This already exists. It will act as the umbrella body for all accreditation agencies.In accordance with the practice followed by the signatories to the Washington Accord,the NBA has also been declared to be an autonomous body. It will act as a cognate body offering support to the activities of the AICTE.

National Centre for Futuristic Education:

34.25 Considerable work has been initiated to harness information technology in the service of technical education. This is being done under different schemes, mostly by selected Professors of IITs.This includes computer aided learning, blended mode, MOOCS and so on. There is a need to create an umbrella Centre which acts under the various schemes and services the entire field of technical education.

This would include the following tasks:

- Act as the umbrella organisation for all IT-based initiatives
- Be the conduit for all new technology
- Collect and disseminate the learning material
- Have the sophisticated material converted to more understandable format by translation into regional languages, restate the material in simpler language and idiom so as to suit the students and faculty of non-metropolitan and mofussil colleges.
- Create a National Library of Futuristic Educational Material and regulate the release thereof to institutions, research bodies and individuals.

- Experiment with various models of virtual laboratories and supply these to those desirous of using the same for distance education and lifelong education.

Regional Offices

34.26 Currently there are eight Regional offices of the Council. These are for the Eastern, the North Western, the South Central, the Southern, the Central, the Western, the South Western and the Northern regions.

34.27 There are Regional Committees in each Region. These Committees have been processing the cases for approval of new institutions and increase in intake capacity of existing institutions.

34.28 We heard different opinions being expressed by different stakeholders who appeared before us. One view at the extreme end suggested that there should be a region in every state, so that the Regional Committee felt fully responsible for the integrated development of technical education in a particular State. The other extreme point of view suggested that the regional committees should be abolished and their work taken over either by the state department of technical education or by the State Technological University.

34.29 There were some who wanted the Regional Committees to be fully empowered. Others felt that there was a danger in making them too powerful, as they might misuse their authority and bring a bad name to the AICTE. One suggestion was that they should have a minimal presence and be used as information centres cum- public relations offices.

34.30 **The Review Committee has considered the matter and recommends that** the number of Regional Committees should be raised to ten. Their role should also change in the new order. They should not meddle much in the regulation and approval mechanism. They should keep a watch on institutions and process proposals for mentoring and development for sub-standard institutions.

34.31 The Regional Offices should monitor the progress of plan schemes on the ground, inspect the projects that are sanctioned by the AICTE and submit periodical reports to the concerned headquarters offices.

Constitution of permanent cadre:

34.32 There is complete unanimity on the need to create a permanent cadre of officers and employees in the AICTE. This is imperative if we wish the Council to have a permanent memory and to have a cumulative strategy on each aspect of technical education.

34.33 **The Review committee, therefore, recommends:**

- There should be a permanent cadre of employees in the Council.
- In order to do this, there will have to be an initial constitution of the cadre.
- A formal order will have to be issued by the competent authority giving an option to the employees, both past and present, whether they would like to be inducted into the Council in the initial constitution of the permanent cadre of the Council. The option will have to be exercised by a particular date.
- After the options are received, the cases of those who opt for permanent absorption in the permanent cadre of the Council shall be considered by a Committee. The decision on absorption or otherwise will depend on the pay scale of the post opted for, the qualifications and experience of the candidate and his suitability for the job.
- The empowered Committee shall decide the designation, payscale, qualifications and experience of the person to be appointed to each post. The Wings will be headed by Principal Advisers and the Divisions by Advisers. The supporting cadre shall consist of Directors, Deputy Directors and Assistant Directors.

34.34 People of different specialisations, qualifications and experience shall be inducted into the Council. The following suggestions are offered:

- The Mentoring and Development Wing should be headed by a former Director IIT who shall be designated as Principal Adviser
- The Engineering and Technology Division should be headed by an Adviser, who shall be a Professor in an IIT or a Director of an NIT.
- The Management and Pharmacy Division shall be headed by an Adviser who shall be a former director IIM
- The Financial Assistance Division shall be headed by an Adviser who shall be an expert on manpower planning. Experience of surveys and statistics should be an added qualification.
- The Regulation Wing shall be headed by a Principal Adviser, who shall have experience of rating, accreditation, institution appraisal and so on.
- The Administration and Coordination Wing shall be headed by a Principal Adviser. He should preferably be a person who has experience of working in the AICTE.

- The Finance Division should be headed by an officer from the IA&AS or any other Accounts Service of the Central Government.
- The Administration Division should be headed by an Adviser. Should have experience of administering the Council.
- The Vigilance Division should be headed by an Adviser, drawn on deputation from the cadre of CVOs in the Central PSUs.
- The Legal Division should be headed by a Chief Legal Adviser drawn from the Indian Legal Service.

34.35 The autonomous bodies should be set up in the following manner

- The National Testing Agency should be drafted from the CBSE.
- The National rating Agency should be headed by a person who has experience of rating and accreditation.
- The National Centre for Futuristic Education should be headed by a Principal Adviser, who should have experience of IT-based learning.
- Regional Offices should be headed by Advisers who shall be insiders of the AICTE or have had experience of working in the Council.

Concluding remarks:

34.36 The Review Committee has no hesitation in saying that the manpower framework of the refurbished AICTE should not be laid down by outsiders like us. The entire exercise should be placed in the hands of an Empowered Committee which may be a subcommittee of the Executive Committee. It could be a compact Committee constituted as under:

Chairman of the AICTE

Additional Secretary(TE) MHRD

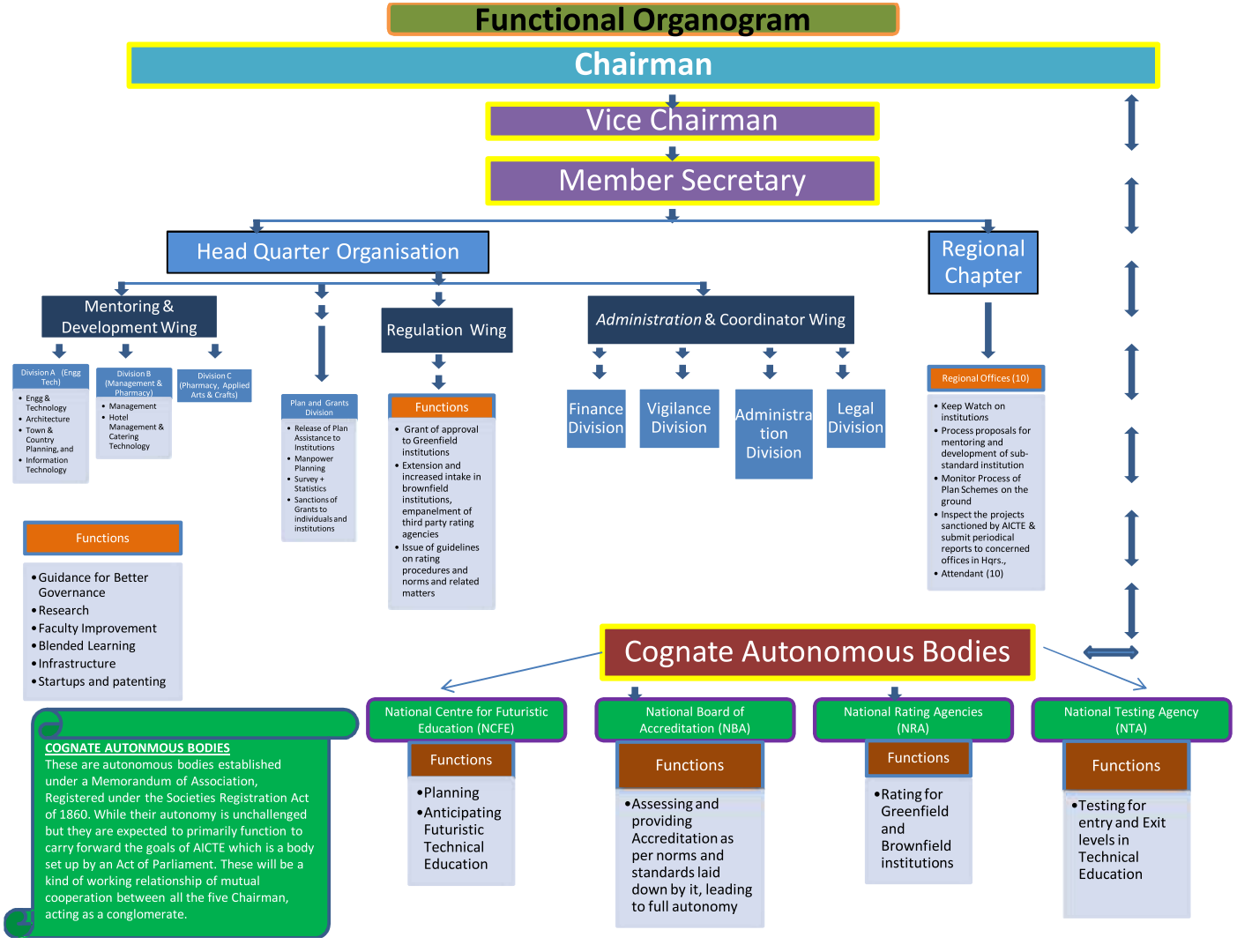
Financial Adviser, MHRD

An officer who has served for a long period in the Council

An ex-Director or Professor of an IIT.

34.37 The importance of the manpower framework exercise cannot be over emphasized. It should be taken up immediately and seriously, and be concluded in a time-bound manner.

Annexure to Chapter 34 : Functional Organogram



Chapter 35

Towards a global presence

The reason a lot of people do not recognize opportunity
is because it usually goes around wearing overalls and looking like hard work
Thomas Edison

35.1 When it comes to higher education, most often, one hears three things: demographic dividend, scale but lack of quality assurance and higher investments in education. There is a fourth aspect which is by and large ignored – India can be a destination for educating the world – if not the world, a large segment of the world. India has tremendous potential to provide higher technical education to the world.

35.2 Ernst and Young report on Higher Education in India – Vision 2030 states: By 2030, India will be amongst the youngest nations in the world. With nearly 140 million people in the college-going age group, one in every four graduates in the world will be a product of the Indian higher education system.

35.3 Over the last two decades, India has remarkably transformed its higher education landscape, of course a lot more needs to be done as is evident by this report. Total enrolment in higher education has been estimated to be 30 million, and approximately 17% are in technical education – i.e. 5.1 million students are in technical education (the numbers are rounded off and are based on All India Survey on Higher Education – 2011-2012). As per the survey there are roughly 34000 foreign students enrolled in higher education – an abysmally small number. Consequently, the global impact of our education system is very low.

35.4 Of course, we make an impact when our graduates work all over the world -- but we can make a bigger impact by having a sizeable number of foreign students acquiring technical education in India. In the globalized world, cultural cognizance and assimilation is very important. This will be achieved when students from different parts of the world study in India – they will not only undergo technical education, but will learn India. This learning of India will become vital for the Make in India mission when foreign industries want to set shop in India, and even more vital when Indian industries would be setting up their plants in foreign countries. In a globalized world, industrial traffic will be both ways, and cultural assimilation will be crucial in establishing this two way highway.

35.5 At present we are overwhelmed with our own numbers and are working very hard to improve the quality of technical education. But there is an opportunity for us, and it is imperative that we start exploring ways and means to harness this opportunity. Indian education market is about US 110 billion dollars – almost comparable to the size of the IT industry. Of course, the education sector is almost 100% domestic. The size of the education market shows its strength and that we can create an ecosystem where significant foreign students can get technical education in India. Often the argument used is that we improve quality of education in India so that students from India will not go overseas and thereby we can arrest the outflow of foreign exchange. Given the push-pull dynamics of the globalized world, it is imperative that we attract a large number of foreign students to India for technical education – and thereby create an environment so that there is significant reduction in the net outflow of foreign exchange for technical education.

35.6 We can make it even more attractive for foreign students to study in India by enabling global mobility of credits. In earlier chapter we have talked of modularity and credit mobility within the country. There is no reason why we can't expand credit mobility and modularity for foreign students also. They could do part of the program in their home country and part in India – and these parts could be intertwined.

35.7 We can also exploit ICT (information and communication technologies) for providing technical education across the globe.

35.8 There are a few things we need to do in order to make India a destination for technical education.

i. Innovative academic program: We should be offering a differentiated technical education. The kind of innovations we have talked about in different chapters should be incorporated in our system as soon as possible.

ii. Quality assurance: This is the most important element – the academic quality of our technical education must be of the highest level for making India a destination for education.

iii. Education infrastructure: We cannot expect foreign students to stay in hostels with bad sanitation and poor amenities. It is imperative that we upgrade our infrastructure. Besides infrastructure, we need to develop state of the art teaching laboratories.

iv. Openness of the mind to accept ideas from overseas students – India has always been open to new ideas - - but we need to enhance it further since these ideas would be coming from 20 year olds.

v. Overall a conducive ecosystem which enables experiential learning in India.

35.9 If we do the right things, just like 'make in India', educating in india could be a game changer.

Chapter 36

Enhancing AICTE budgetary resources

An investment in knowledge pays the best interest

36.1 The suggestions made in this report, regarding moving AICTE to light regulation and greater support role is not possible without significantly enhancing the budgetary resources of AICTE. The **Committee recommends** that AICTE be given a budgetary support to the tune of ₹ 5000 Crores per year at today's prices with inflation factor built into the yearly grant. This would be the budget required as the recommendations of the committee are implemented and rating of Technical Institutes is in place, so that significant percent of the budget is spent based on the ratings.

36.2 There are two kinds of support identified. One kind of support is primarily needed for the first few years to build certain infrastructure; this could be done in three to four years and the budget for the item would considerably reduce after that. For example, the network budget has been identified as ₹ 500 Crores per year. Support for three to four years at this level may be needed to get this implemented for all the 8000 technical institutions. From thereon, the sum required may be no more than ₹ 200 Crores per year. Similarly the support identified in table given below for knowledge and grade-card repositories may be required only for the first three to four years and a smaller amount after that.

36.3 The break-up of ₹5000 Crores required once the recommendations of this report are implemented, is given in the table. Most of this constitute expenditures on new programs. For example, the committee has suggested that candidates from the top 15 to 20% of their undergraduate (not post-graduate) class, should be taken as faculty-trainees. This could be supported in all public and private institutions by AICTE in the form of part-salaries and paying their PhD fees. However, anyone who is not in the top 15% bracket must not be supported by this budget. Similarly, the money for faculty training here is for AICTE program discussed in chapter 20. It should not be used to support any lower quality trainings. The D2S Live classes and MOOCS support should also be used only for high-quality programs to be conducted by AICTE with support institutions like IITs and IIMs, as discussed in Chapter 20. Similarly only those

institutions which get high rating, should be supported for augmentation of infrastructure and for projects on enhancement of industry interaction and for supporting entrepreneurship.

36.4 A sum of ₹100 Crores is identified here for mentoring institutions; those institutions which are showing promise by an increase in rating (even when the absolute rating is still low) could be supported to continue to improve; the support program could also have a mentor institution for each such institute supported. Similarly there may be some expenditure in merging / closing institutions which have bad ratings and have failed to improve it inspite of warnings; a sum of ₹ 200 Crores is identified towards this. This may not be required for the first few years. Today the technical universities are supported by UGC; since this report recommends that they would be regulated in future only by AICTE, their support is also to be shifted from UGC to AICTE. A sum of ₹ 250 Crores have been identified for that. The report has recommendations for financial viability of State Universities in Chapter 32. AICTE should support these universities as long as the recommendations of the report are implemented and their ratings start improving.

36.5 Finally, a sum of ₹ 300 Crores has been identified for scholarships. There are several existing scholarship programs for students from backward regions and for students with some disadvantages. This needs to be gradually expanded so that economically weak students are not denied technical education. Some funds could also be used as seed money to create / expand student loan programs with concessional interest. Also a sum of ₹150 Crores is suggested for existing schemes. Several of these schemes (like faculty development and ICT based education) has been provided for separately. The existing schemes need to be reviewed and re-castto be in line with suggestions in this report and funded using this amount. Those which improve quality and ratings can be expanded in due course.

Finally, the committee has recommended that no differentiation in support should be made in between public and private institutions. The financial problems of public institutions need to be addressed separately and not through AICTE.

BUDGETARY PROVISIONS AT A GLANCE

Sr No	Title of the Scheme - AICTE Budget at 2015 prices once rating is set	Existing Schemes at AICTE which can be subsumed under the proposed scheme	₹ Crores
1.	Faculty training	• Faculty Development Prog. • Scheme of Seminar Grant • Scheme of Travel Grant • Summer Winter School Scheme • QIP	500
2.	Faculty early induction (from top 15% of B.Techclass)	• Career Award For Young Teachers (CAYT)	500
3.	D2S Live Classes + MOOCs++	NEW SCHEME	1000
4.	e-labs and lab development	• E-Learning Centre for Technical Education	250
5.	Experiments in innovative curriculum	NEW SCHEME	250
6.	Administrator training	NEW SCHEME	100
7.	Research on rating, Education Technology and Pedagogy	• RPS, Innovation Promotion Scheme.	100
8.	Knowledge dissemination infra	• AICTE-INDEST Consortium	200
9.	Grade –card repositories		200
10.	Network Infrastructure		500

Sr No	Title of the Scheme - AICTE Budget at 2015 prices once rating is set	Existing Schemes at AICTE which can be subsumed under the proposed scheme	₹ Crores
11.	Augmentation of infra at institutes doing well (high-rated)	• MODROBS	400
12.	Projects on enhancement of industry interaction and entrepreneurship development(high-rated)	• Industry Institute Partnership Cell • Entrepreneurship Development Cell • Nationally Coordinated Project Scheme • National Facilities In Engineering And Technology With Industrial Collaboration • Research Park	250
13.	Mentoring institutions	NEW SCHEME	100
14.	Merging low –rated institutions	NEW SCHEME	200
15.	Technical universities budget from UGC	NEW SCHEME	250
16.	Scholarships	• National Doctoral Fellowship Scheme • Scholarship Scheme to Girl Child (SSGC) • Scholarship Scheme to Physically Handicap Students • PG scholarship300	250

Sr No	Title of the Scheme - AICTE Budget at 2015 prices once rating is set	Existing Schemes at AICTE which can be subsumed under the proposed scheme	₹ Crores
17.	Existing schemes	ALL AQIS schemes not included above • Emeritus Fellowship • Project Centre for Technical Education • Hostels for SC/ST Students • Skill and Personality development Program centre for SC/ST Students • Visiting Professorship • AICTE-INAE-DVP • AICTE-INAE-TG • AICTE-INAE-TRF **Additional schemes as detailed below offered through NSQF and University Bureau also need to be included as detailed below** • Community College • Employability Enhancing training programme (EETP) • National Employability Enhancement Mission (NEEM) • North East Quality Improvement Programme (NEQIP)	150
18.	AICTE salaries, admin, travel, infra		250
		GRAND TOTAL	**5500**

Chapter 37

Implementing the recommendations

You can't cross a sea by merely staring into the water.
— *Rabindranath Tagore*

37.1 We are approaching the end of our labours. We have the greatest respect for the Ministry of Human Resource Development, Government of India. But just to be extra careful, we would like to underline some of the dangers of the implementation phase.

37.2 The greatest danger is that Government appoints an Empowered Committee to oversee the implementation of our recommendations. This is the normal route and it is easy to take. The result is that the Committee will get to be notified and nothing will further happen thereafter.

37.3 The last Review Committee under the chairmanship of U.R. Rao presented its report to the Government in 2003. We requested both MHRD and AICTE to give us an action taken report on the recommendations of the Rao Committee. Both organisations disclaimed the knowledge of any such document.

37.4 The AICTE had an original excuse. There was a phase when the AICTE's activities had come under the CBI scanner. Accordingly, the entire record of the Council, including the library, had been shifted to the Lucknow Regional Office and was no longer traceable. Till this day, no one has been able to enlighten us about what happened to the voluminous recommendations of our predecessor Committee.

37.5 This situation is not unique to AICTE. There have been any number of Commissions and Committees in the various Ministries. If even a fraction of their recommendations had been acted upon, the country would have made phenomenal progress.

37.6 The second hazard is that our Report may be implemented in parts and not as an integrated whole. We have waded through reams of material and held endless discussions both with the stakeholders and the experts. We have discussed all the issues, big and small, and tried to produce a line of action that is not tainted by the poison of extremist thinking. The balance that we have sought to create between autonomy and regulation is very delicate. We have attempted to sort out sensitive issues of jurisdiction and adjudicated upon turf battles of territorial prerogative.

37.7 There are various interest groups trying to gain ascendancy in the educational marketplace. Billions of dollars hinge upon every decision that the Government takes. So various lobbies are hyperactive in having their interests protected.

37.8 We would request that our recommendations be accepted and implemented as an integrated package without any further re-examination of the policies referred to us.

37.9 We are convinced that the Government is serious in taking full advantage of the demographic dividend. That is why it has launched the Skill India Initiative, the Make in India policy, the Digital India drive and the "minimum government maximum governance" policy. We would like to assure the Government that if our recommendations are implemented in toto and with full faith in our expertise and our experience, it is guaranteed that India will become a Technical Education Superpower of the 21st Century within a short span of a decade!

Chapter 38

Final word!

Liberty means responsibility. That is why most men dread it
George Bernard Shaw

38.1 And now to conclude. We started with the resolve to set Saraswati free, untrammelled, her chains unbound.

38.2 A critical review of the way the various regulatory agencies had worked in the past showed clearly that:

- The UGC, the AICTE, the DEC, the Pharmacy Council of India, the Council of Architecture and so on had woven a steel web of restrictions and rules around her.
- Their respective turfs were not clearly demarcated, leaving vague boundaries, which were a haven for legal casuistry and jugglery.
- AICTE was hamstrung by the pressures exerted by the political, bureaucratic and corporate potentates who did not always permit it to provide a fair deal, devoid of favouritism and injudicious use of discretion.

38.3 The Committee delved into the reasons for the current situation and came up with the following solutions:

- The AICTE should exercise its regulatory role in a highly attenuated form and even here its decisions should be semi-automatic, based on the rating earned by an institution from an empanelled third party rating agency.
- UGC's role should be one of non-interference with technical institutions. The affiliating role may be performed by Technical Universities but even this function should disappear over a period of ten years as institutions move towards complete autonomy.
- AICTE's primary role should be to mentor and develop the institutions on an ascending scale of graded autonomy through training of faculty, use of ICT-based technology for teaching and continuous improvement in the quality of governance of technical institutions.

- The subject councils should come into the picture only when a technocrat sets up a professional practice.

38.4 The Committee examined the manner in which India could become a technical education superpower and advocated the following strategy:

- 100% literacy at the earliest
- Universalization of elementary education
- Integration of vocational education, industrial training and technical education with seamless transfer of credits across states, educational streams and subject areas.
- Deflection of 80% of the student population into the Skill India Initiative

38.5 The committee suggested the following areas of special importance:

- Emphasis on values
- Imparting of courage, dynamism and unconventional thinking among students so that they chase quality and excellence
- Using autonomy to frame modern, unusual curricula with accent on solving practical problems faced by society

38.6 There were a number of structural changes that came up for consideration. Some of the important suggestions are:

- Converting AICTE into a Constitutional authority which would be insulated against pressures
- Grant of a Rs 5000 crore annual budget to AICTE
- Creation of several autonomous agencies like the National Testing Agency, National rating Agency and National Board of Accreditation to help AICTE attain its objectives
- Making technical education a fundamental right
- Creation of a permanent cadre of technocrats and managers to make AICTE a dynamic, effective and apex organisation in a leadership role.

38.7 The Committee would like to sum up its strategy in seven A's as under:

A : ACCEPTANCE OF APEX STATUS FOR AICTE

A : AMENDMENT OF THE LAW AND THE CONSTITUTION

A : AUTHORITY TO DELIVER RESULTS

A : ADEQUACY OF BUDGETARY SUPPORT

A : A PURSUIT OF QUALITY AND EXCELLENCE

A : AUTONOMY: ACADEMIC, FINANCIAL AND TOTAL

A : A HIGH-POWERED POLICY PUSH AT THE HIGHEST LEVEL.

38.8 The Committee hopes and prays that the Government of India in the Ministry of Human Resource Development will, under the dynamic leadership of Smt. Smriti Zubin Irani, take up these recommendations in the spirit in which these have been formulated.

38.9 Let the year 2015 be the memorable year of liberation of Saraswati from the fetters of old-fashioned conformism, rigid rule-bound regulation and national neglect of education as a sector of development.

Appendices:

Amendment to the Constitution of India

A.1 Technical education should be a fundamental right,

A.1.1 It has been suggested in the text that the acquisition of a skill leading to a job should be a fundamental right of every citizen of India. The skill may be acquired through vocational education, technical training or technical education.

A.1.2 Accordingly, Article 19 (1) of the Constitution of India would have to be amended as under:

"To acquire skills that may lead to a job, whether through vocational education, industrial training or technical education."

A.1.3 Vocational education would give best results if started in Class 2, but in no case should this investiture be postponed beyond Class 5.

A.1.4 When the student reaches Class VIII it is time for industrial training in Industrial Training institutes.

A.1.5 The final stage would be the technical education institutions where all the tiers of the technical education arena are simultaneously available and the system permits the student to migrate easily between schools, ITIs and Engineering Colleges.

A.1.6 It is only with such ease of access and shifting that we can send the huge numbers that will be churned out by the educational system into skilled occupations.

A.2 Setting up of AICTE as apex constitutional body:

A.2.1 It has also been suggested in the text that the AICTE should be a Constitutional body with some special characteristics.

A.2.2 Accordingly we may include a new Article in the Constitution of India, as under :

Article?? (Number to be allotted) Setting up of the All India Council for Technical Education:.

(1) There shall be an All India Council for Technical Education. It shall be wholly autonomous. It shall be the apex body charged with the responsibility of coordinating

and managing the technical education system throughout this country.

(2) It shall be headed by an independent Chairman, who shall be a technologist of international stature. He shall be appointed under a special procedure laid down in the AICTE Regulations. The final selection shall be made by a panel headed by the Prime Minister. The other members of the panel shall be the HRD Minister, Leader of the opposition party having the maximum number of MPs next to the ruling party and the Cabinet Secretary.

(3) The Chairman shall hold office for a period of five years and shall retire on the date he completes his tenure of five years or attains the age of seventy years. He cannot obtain an extension of tenure nor can he be given a second tenure.

(4) The Chairman can be only removed by a procedure of impeachment analogous to the procedure prescribed for Judges of the Supreme Court of India.

A.2.3 Financial provisions: The AICTE shall be protected from the vagaries of political and administrative attention as under:

(1) There shall be an annual block grant from the Ministry of HRD to the AICTE.It shall amount to Rs. 5,000 crores for the Financial Year 2015-16. There shall be an escalation of 10% from year to year.

(2) The budget provision shall be non-divertible and non-lapsable. The amount shall be "charged" to the Consolidated Fund of India.

A.2.4 There shall be no interference by the Govt in the affairs of the AICTE. The MHRD shall not be entitled to issue directions to the AICTE except on issues of broad public policy. Any person who interferes with the working of the AICTE shall be liable to be prosecuted under the appropriate Section of the Indian Penal Code.

Amendments to the AICTE Act, 1987

B.1 **Mentoring role for AICTE:**

It has been stated in the body of the Report that the AICTE will have to be reinvented, so as to gradually relinquish its role of a policeman cum regulator. It has to assume a mentoring and facilitating role. Accordingly the following legal provisions have to be incorporated n the AICTE Act, 1987.

B.2 **Amendments to AICTE Act, 1987**

Section :*The UGC currently affiliates the technical education institutions. The entire infrastructure of affiliation has to be dismantled within a period of ten years.*

Section: *The technical education institutions have to be guided and mentored so that their performance improves. As the rating of an institution crosses a certain pre-designated level, it becomes entitled to graded autonomy. When it is accredited and reaches a certain level of excellence in accreditation status, it finally obtains the status of an Deemed-to-be autonomous technical institution.*

Section: *Graded autonomy provides academic autonomy, then financial autonomy and finally the power to hold examinations and award degrees. Once an institution reaches this level, its affiliation to a university ceases.*

Section: *The UGC Act also stands amended accordingly.*

B.3 **Amendment to Section 2(h) of AICTE Act, 1987:**

This Section defines a technical institution as an institution not being a university. It has been interpreted to mean that technical institutions which are part of a university do not fall under the jurisdiction of the AICTE.

In order that such institutions are covered by the AICTE, the phrase *"not being a university"* may be deleted.

Amendments to AICTE regulations

The AICTE Regulations shall stand amended as follows:

The appointment of the Chairman AICTE shall be made as provided in the Annexure to Chapter 12'.

Similar changes may be made in respect of appointment to the posts of Vice Chairman and Member Secretary of AICTE.

Amendments to UGC Act

D.1 The following amendments to the UGC Act are required:

D.2 Section: *All technical institutions shall be subject to the control and jurisdiction of the AICTE and any provision in the UGC Act which lays down otherwise shall stand repealed.*

D.3 Section: *The system of affiliating technical institutions to universities shall be done away with within a period of ten years. This shall be achieved by the grant of graded autonomy to technical institutions which secure a rating higher than a pre-designated level as also get accreditation with a grading above a certain pre-designated level.*

D.4 *As the conditions for graded autonomy are fulfilled, the technical institutions shall first receive academic autonomy, then financial autonomy and finally they shall be granted the status of Deemed to be Autonomous Technical Institution . When the last stage is crossed the technical institution shall be disaffiliated from the university and be entitled to hold examinations and award degrees.*

Amendments to the Pharmacy Act

E.1 AICTE jurisdiction supreme:

Under Section 2(f) of the AICTE Act 1987, "technical education" has been defined and inter alia includes pharmacy also. It is clarified that for the purpose of initial approval of a Greenfield institution and for enhancing the intake of students in brownfield institutions and laying down norms and standards for rating and accreditation of pharmacy institutions, these should be under the jurisdiction of the AICTE.

E.2 *Any provisions in the Pharmacy Act that run counter to the above principle shall stand repealed.*

E.3 *Resolution of disputes:*

All matters of dispute or disagreement between the AICTE and the Pharmacy Council of India shall be referred to the Board of Studies for Pharmacy in the AICTE, where the PCI is also represented. The matter shall be discussed in the meeting of the Board of Studies and the consensus decision arrived at in the Board shall be binding on all parties. In important cases, the matter may be taken to the Executive Committee or the Council of the AICTE for a final view.

List of individuals and organisations who appeared before the Committee

S.No.	Name of the Organisation	Name
01	**MHRD**	1. Shri Amarjeet Sinha, Additional Secretary 2. Shri R. Srinivasan, Director 3. Ms Tripti Gurha, Director
02.	**Scientific Departments**	1. Dr. R.B. Grover, VC, Homi Bhabha National Institute 2. Dr. Suman Govil, Adviser, Department of Biotechnology 3. Dr. A.K. Pipal, Scientist 'E', DEITY 4. Dr. S.C. Vyas, Scientist 'D', DEITY 5. Dr. A. Mukhopadhyay, Head, Inspire & FIST Divisions, Department of Science & Technology, Delhi 6. Shri Vivek Singh, OSD, Department of Space
03.	**IITs**	1. Prof. R.K. Shevgaonkar, Director, IIT Delhi 2. Prof. Pradipta Banerji, Director, IIT, Roorkee 3. Prof. M.K. Surappa, Director, IIT Ropar 4. Prof. Prem Kumar Kalra, Former Director, IIT, Jodhpur 5. Prof. O.P. Shah, Dean, Continuing Education, IIT Kharagpur 6. Prof. D. B. Phatak, Department of Computer Science & Engineering, IIT Bombay 7. Prof. Vikram M. Gadre, Department of Electrical Engineering, IIT Bombay
04.	**IIMs**	1. Prof. Bakul Dholakia, Former Director IIM Ahmedabad 2. Dr. Pritam Singh, Former Director, IIM Lucknow 3. Prof. Vinay Shil Gautam, Founder Director, IIM, Kozhikode 4. Dr. Amitabha De, Director, Rajiv Gandhi Indian Institute of Management, Shillong 5. Dr. Prafulla Agnihotri, Director, IIM Tiruchirappalli

05.	**NITs**	1. Prof. I.K. Bhat, Director, NIT, Jaipur 2. Prof. T. Srinivasa Rao, Director, NIT, Warangal 3. Prof. Ashok De, Director, NIT, Patna 4. Dr. G.R.C. Reddy, Director, NIT, Goa 5. Prof. Rajat Gupta, Director, NIT Srinagar (J&K) 6. Prof. Arun Baran Samaddar, Director, NIT Sikkim 7. Dr. Gopal Mugeraya, Director, NIT Agartala 8. Dr. Swapan Bhattacharya, Director, NIT Surathkal 9. Prof. H.T. Thorat, Director, NIT Srinagar, Garhwal 10. Prof. Tarkeshwar Kumar, Director, NIT Durgapur 11. Dr. P.D. Porey, Director, SVNIT, Surat 12. Dr. Narendra S. Chaudhari, Director, VNIT, Nagpur 13. Prof. Rajnish Srivastava, Director, NIT Hamirpur
06.	**IIITs**	1. Dr. S.G. Deshmukh, ABVIIITM, Gwalior 2. Prof. R. Gnanamoorthy, IIITD&M, Kancheepuram 3. Dr. Pankaj Jalote, Director, IIIT-Delhi
07.	**NITTTR**	1. Dr. P.K. Tulsi, Head EEMD, NITTTTR, Chandigarh
08.	**Skill Development**	1. Shri Dilip Chenoy, MD & CEO, NSDC 2. Sh. Samarendra Sahu, Additional Development Commissioner, MSME 3. Shri Pawan Kumar Agarwal, JS, Ministry of Skill Development, Entrepreneurship, Youth Affairs & Sports
09.	**Industry Thought Leaders**	1. Shri T.V. Mohandas Pai, Chairman, MaGe, Manipal Foundation, Bangalore 2. Shri Rajiv Sachdeva, Ex MD Siemens India
10.	**Industries**	1. Ms Shobha Mishra Ghosh, Senior Director, FICCI 2. Shri Vinay Rai, ASSOCHAM 3. Ms. Shalini Sharma, Head, Higher Education, CII 4. Shri Nikhil Sahani, Sr. President, Yes Bank 5. Dr. Rajesh Pankaj, FICCI 6. Shri K. Purushothaman, Regional Director, NASSCOM, Chennai 7. Shri Angeline Premkumar, Lead, Talent Acquisition, Infosys, Chennai

		8. Shri S.R. Ramakrishnan, Director, SPIC Limited, Chennai 9. Shri Ramkumar, Senior Vice President, Cognizant, Chennai 10. Prof. B.B. Dhar, Quality Council of India 11. Dr. R.P. Singh, Quality Council of India 12. Shri Vipin Sahni, Quality Council of India
11.	**AICTE**	1. Prof. S.S. Mantha, Chairman 2. Prof. A.S. Pant, Chairman, (Acting) 3. Dr. M.K. Hada, Adviser-I 4. Dr. S.G. Bhirud, Adviser-I, 5. Dr. Renu Bapna, Adviser-I 6. Dr. A. Rajasekharan, Adviser-II 7. Dr. P. Ullagadi, Adviser-II 8. Dr. S.K. Goel, Director 9. Dr. R.S. Rathore, Director 10. Dr. S.M. Suresh, Director 11. Dr. M.S. Manna, Director 12. Dr. Ramesh U., Director 13. Dr. Vinita Arlya, Director 14. Dr. N.H. Siddalinga Swamy, Director
12.	**Former Authorities of AICTE**	1. Prof. R. Natarajan, Former Chairman, 2. Prof. D. Acharya, Former Chairman, 3. Prof. D.V. Singh, Former Vice Chairman, 4. Prof. R.S. Nirjar, Former Chairman I/c 5. Dr. K.P. Isaac, Former, Member Secretary
13.	**University Grants Commission**	1. Prof. Ved Prakash, Chairman 2. Prof. Dr. Jaspal Singh Sandhu, Secretary
14.	**NAAC**	1. Prof. A.N. Rai, Director
15.	**NBA**	1. Dr. Surendra Prasad, Chairman 2. Dr. A.K. Nassa, Member Secretary 3. Dr. D.K. Paliwal, Former Member Secretary 4. Dr. P.N. Razdan, Former Adviser 5. Dr. I.K. Bhat, Former Adviser

16.	**Universities**	1. Dr. K.P. Issac, VC, Kerala Technological University, Thiruvananthapuram 2. Prof. K. Lalkishore, VC, JNTU, Ananthapur 3. Dr. Chandra Krishnamurthy, VC, Pondicherry University, Pondicherry 4. Prof. R.P. Dahiya, Vice Chancellor, Deenbandhu Chhotu Ram University, of Science & Technology, Murthal, Sonepat, Haryana 5. Prof. R.L. Sharma, Vice Chancellor, Himachal Pradesh Technical University, Hamirpur (H.P.) 6. Prof. Nalinaksh S. Vyas, Vice Chancellor, Rajasthan Technical University, Kota, Rajasthan 7. Prof. Ashish Mazumdar, Dean, ISLM, Jadavpur University, Kolkata, West Bengal 8. Dr. Buta Singh Sidhu, Dean Academic, Punjab Technical University, Jalandhar, Punjab 9. Er. Rajiv Ranjan, Controller of Examinations, Aryabhatta Knowledge University, Patna, Bihar 10. Prof. S.P. Khatkar, Proctor, Faculty of Engineering & Technology Maharshi Dayanand University, Rohtak, Haryana 11. Dr. G. Viswanathan, Chancellor, Vellore Institute of Technology, Vellore' 12. Prof. J. Karthikayan, Principal, SV University College of Engineering, Tirupati 13. Shri Kamal Bijlani, Amrita University 14. Ms. D. Mahalakshi, Chairperson, Vel Tech University, Chennai 15. Shri K.V.N. Kishore Kumar, Veltech, Chennai 16. Dr. T.V. Gopal, Dean International Relations, SRM University, Chennai 17. Shri D. Kingsly, Dean, Mechanical Engineering, SRM University, Chennai 18. Dr. G. Angnstine, JQAC, SRM University, Chennai
17.	**State Governments**	1. Shri B. Srinivas, Secretary, Higher Education, Government of Kerala 2. Smt. B. Udayalakshmi, Commissioner, Technical & Higher Education, Government of Andhra Pradesh 3. Shri P. Narasimman, Assistant Director, Government of Tamil Nadu 4. Dr. Chandra Shekhar Kumar, IAS ,Commissioner-cum-Secretary, Employment & Technical Education & Training Department, Government of Odisha

		5. Shri K. Lal Nghinglova, Commissioner & Secretary Higher & Technical Education, Mizoram 6. Dr. V.S. Purani, Joint Director (TE), Government of Gujarat 7. Shri Shashank Gupta, Dy. Director (TE), Government of NCT of Delhi 8. Dr. Shailesh K. Trivedi, Dy. Director (TE), Government of NCT of Delhi 9. Shri A.K. Ahuja, Joint Director (TE), Government of Himachal Pradesh
18.	**Education Experts**	1. Dr. Leena Chandran Wadia, Senior Fellow, Observer Research Foundation 2. Shri P. Palanivel, Executive Secretary, EPSI
19.	**Rating Agencies**	1. Shri Shri Raman Uberoi, Ratings Head, CRISIL 2. Shri V. Srinivasan, Chief Strategy Officer & Business Head-SME and Real Estate Ratings, CRISIL 3. Shri P. Sudhakar, Assistant GM, CARE 4. Shri Rajesh Mokashi, Deputy MD, CARE 5. Shri Shubham Jain, Vice President, ICRA Limited 6. Shri Jayanta Chatterjee, Executive Vice President, ICRA Limited
20.	**Distance Education**	1. Dr. Prof. H.P. Dikshit, Former Vice Chancellor, IGNOU 2. Prof. Nageshwar Rao, Vice-Chancellor, I/C, IGNOU, Delhi 3. Dr. Shiv Kumar Vyas, Associate Professor, IGNOU, Delhi 4. Prof. P.S. Kumar, Director, SOET, IGNOU, Delhi 5. Prof. A.K. Saini, University School of Management Studies, GGSIP University, Delhi 6. Shri S.K. Prasad, System Analyst, NIOS, Noida 7. Shri Ravi Shankar, Joint Director, (Media), NIOS, Noida
21.	**Management Education**	1. Shri Sunil Varughese, Chief Brand & Sustainability Officer, XLRI, Jamshedpur 2. Dr. M.P. Jaiswal, MDI, Gurgaon 3. Prof. J.K. Das, Director, Fore School of Management, Delhi 4. Dr. Raj Agarwal, Director-CME, AIMA, Delhi

		5. Prof. B.A. Metri, Dean (Graduate Programme), International Management Institute,, Delhi 6. Dr. Rajesh Khajuria, Director, Shri Mahavira Jaina Vidyalaya Education Foundation C.K. Shah Vijapurwala Institute of Management, Vadodara 7. Dr. Raju Chandrasekar, Management Consultant, Bangaluru 8. Dr. Uday Salunkhe, Group Director, Prin. L.N. Welingkar Institute of Management Development & Research, Mumbai 9. Dr. Ajay Kumar Singh, Hony. President, Delhi School of Professional Studies & Research, Delhi 10. Shri Kamal Singh, DG, National HRD Network
22.	**Subject Matter Councils**	1. Dr. Uddesh Kohli, Chairman, Engineering Council of India 2. Smt. Archna Mudgal, Registrar-cum-Secretary, Pharmacy Council of India 3. Shri Raj Kumar Oberoi, Officiating Registrar, Council of Architecture
23.	**Self Financing Institutions**	1. Dr. Thangam Meganathan, Rajalakshmi Engineering College 2. Shri Jaleel, Chairman, Sethu Institute of Technology, Virudhunagar, TN 3. Prof. Sasikumar, Chairman, Sree Buddha College of Engineering, Alappuzha, Kerala 4. Shri Kishore, Vice chairman, RMK Engineering College, Kavaraipettai, TN 5. Shri Selvaraj, Chairman, Shivani Engineering College, Srirangam 6. Shri C. Valliappa, Chairman, Sona College of Technology, Salem, TN 7. Dr. S. Salivahanan, Principal, SSN College of Engineering, Kalavakkam (TN) 8. Dr. Srinivas Mayya, Principal, Srinivasa Institute of Technology, Mangalore

List of persons and organizations who presented written memoranda to the Committee

1. Admin RDIAS
2. Adv. Vaishali Jain Walchale, Secretary, Mukund Education Society, Washim, Maharashtra India
3. An Indian citizen
4. Ar. S.P.Kulkarni
5. Association of Gazetted Officer's in Technical Education, Delhi
6. Association of Private Self Financing Institutions of Haryana, Sonipat, Haryana
7. Austin Correa
8. Brig (Dr) V K Panday(Retd) Hony Secretary General & Governing Council Member Institution of Electronics and Telecommunication Engineers,
9. CA Sunil Jose Thayil
10. CMS COLLEGE OF ENGINEERING
11. Commander K Velu(Retd) Chairman, Sri Venkateswara Group of Institutions
12. Consortium of Self financing Professional Arts and Science College
13. Contractual Staff of AICTE
14. Director General Apex Group of Institutions,
15. Director, Modi Institue Of Management & Technology
16. Dr A K Suryavanshi, Professor
17. Dr Anil Sajnani, Asst. Professor - Amity University (AITEM)
18. Dr Anurekha Jain, Principal TIFAC-CORE in Green Pharmacy BR Nahata College of Pharmacy-SIRO
19. Dr Asish K Mukhopadhyay
20. DR Daljit Singh
21. Dr Lakshmiprabha, Principal,Govt College of Tech
22. Dr M. Murugan, PhD., Director, College of Poultry Production and Management,

23. Dr Ritvik Dubey Director Faculty of Commerce & Business Management Amrapali Institute of Management & Computer Applications
24. Dr Sanjay Toshniwal Educationist and Secretary Dr S.K.Toshniwal Educational and Research Trust, Washim (M.S.)
25. Dr Vikas Inamdar Director,IMCC
26. Dr VRK Prasad, VC, Icfai University, Nagaland
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31. Dr. Amresh, Director, Goel Institute of Pharmacy & Sciences,
32. Dr. Anil K Ahlawat, M.Tech (CSE), Ph.D. (GGSIPU) MIEEE, MIETE, SMIACSIT, MIAENG, MCSTA, MITHEA
33. Dr. Antony V. Varghese Professor & Contact person to AICTE Rajagiri School of Engg. & Technology.
34. Dr. Aradhana Chopra
35. Dr. Ashish Maloo (Chairman) Harikisan Maloo Institute Of Management & Technology, Amravati
36. Dr. Ashish Sarkar Associate Professor School of Petroleum Technology Pandit Deendayal Petroleum University
37. Dr. Asish K Mukhopadhyay Group Director, S R Group of Institutions Jhansi
38. Dr. Awari Mahesh Babu
39. Dr. B. I. Khadakbhavi PRINCIPAL M.B.E. Society's COE,
40. Dr. Basant Tosh
41. Dr. Basanta Kumar Tosh N/6 - 62, IRC Village Bhubaneswar
42. Dr. Bhupinder Sharma
43. Dr. BIJAY KUMAR
44. Dr. Bipin Bihari Lal Principal Bheemanna Khandre Institute of Technology,
45. Dr. C B Prasad, Professor & Head Electrical & Electronics Engineering Department Oriental University
46. Dr. C. C. Tripathi, Associate Professor, & Head ECE, University Institute of

Engineering & Technology

47. Dr. C.H. Vithalani,Assoc. Prof. & Head of the E.C. Department, Government Engineering College,
48. Dr. C.H.V. Purushotham Reddy, Founder Secretary, Chaitanya Degree College, Warangal, Telangana
49. Dr. C.V. Krishna Reddy, Director, NNRNES Group of Institutions, Hyderabad
50. Dr. CA Pramod Kumar Jain, Chairman Dr. CA Prashant Jain, Secretary & Executive Director
51. Dr. Chandra Shekhar Kumar, Commissioner-cum-Secretary, Employment, Technical Education & Training Department, Government of Odisha
52. Dr. Chintha Sailu, Principal, University College of Technology (A), Osmania University, Hyderabad, AP
53. Dr. D. P. KOTHARI Professor (EE) & Director Research Gaikwad - Patil Group of Institutions
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56. DR. D.V.Bhatt, Prof.[Mech] & Dean[Alumni...], S.V National Institute Of Technology
57. Dr. E. Abraham S.J. President, Indian Association of Autonomous Business Schools, Chennai
58. Dr. G. Viswanatha, President, Education Promotion Society for India, New Delhi
59. Dr. G.D. Bansal, Director General, Chandigarh Group of Colleges
60. Dr. G.Maheswaran, Principal, VSA Group of Institutions,
61. Dr. G.R. Ekbote, Progressive Education Society, Pune, MS
62. Dr. H. Chaturvedi, Director, Birla Institute of Management Technology, New Delhi
63. Dr. H. K. PATEL Associate Professor of Mathematics Ujjain Engineering College
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501. Shri Shishupal Singh
502. Shri Shiv Kumar Mourya, Mahmaya Krishak Club, Gonda, UP
503. Shri Shyam Sharma
504. Shri Singamala vamsee krishna
505. Shri Sivakumar Palaniappan, Coimbatore, TN
506. Shri SL Agrawal
507. Shri Sohel Rana
508. Shri Somaraju addepalli
509. Shri Soni Sweta
510. Shri Srihari Challa
511. Shri Subbarao Boppa
512. Shri Subcharan Surya

513. Shri Subir Kumar Banerjee, Swayam Siddhi College Of Management & Research
514. Shri Sunil Bakhru
515. Shri Suresh BV Iyer, Architectural Education in Delh
516. Shri SURESH KATARIA
517. Shri Sweta Patel
518. Shri T. Kishen Kumar Reddy, Ph.D. R E C T O R ,Jawaharlal Nehru Tech. University Hyderabad,
519. Shri T. Lakshmanan, Millath District, Nagapattinam, TN, 614810
520. Shri Tarade Ajay
521. Shri Tariq Ali Khan, Mewar Girls Business School, Ghaziabad
522. Shri Tojo Joseph, Ernakulam, Kerala
523. Shri Tomy Varghese, PNRA V-5, Mannanthala P.O., Thiruvananthapuram.
524. Shri Tomy Varghese, Thiruvananthapuram, Kerala
525. Shri Uma Manpower
526. Shri Umamaheswaran V
527. Shri Umeshan K.V
528. Shri Unni kalady
529. Shri V Vasudeva Rao, Prof.V.Vasudevarao, Prof & Head, Dept of ECM, PVP Siddhartha Institute of Technology.
530. Shri V. Elangovan, Pudukkottai, TN
531. Shri V.B. Ramarao, Hyderabad
532. Shri V.Koteswara Rao, M.Tech., MIEEE, FIETE.,PMACM., (Ph.D)
533. Shri Vasu
534. Shri Vemareddy Srinivasa Raju
535. Shri Venkata Jagannadharaju Datla
536. Shri Venkata Ramana
537. Shri Vignesh Babu S Pharmacy Student
538. Shri Vijay Kannan India Head Blueair India Pvt. Ltd.
539. Shri Vijay Krishnan R
540. Shri Vijay Kumar.G

541. Shri Vikas Pandey, Electrical & Instrumentation Dept.
542. Shri Vikram Kumar
543. Shri Vikrant B. Joshi Principal VES Polytechnic
544. Shri Vinod Kumar kherwal
545. Shri Vinod Kumar, Kandaghat
546. Shri Virendra Mishra, Research Scholar, IIT Delhi
547. Shri Virendra Singh
548. Shri Vishal Jain
549. Shri Vivek Karn
550. Shri VNV Sateesh Babu SVL Polychnic,
551. Shri Yogesh Mohan Gupta, President,Welfare Association of Self-Financed Institutes, Meerut, UP
552. Shri Yogesh Mohanji Gupta President Welfare Association of Self-Financed Institutes
553. Shri Yogeshwar Dharashive
554. Shri Yoginder Anand
555. Smriti Dagur, President Institution of Electronics and Telecommunication Engineers (IETE)
556. Smt. Hemlata Katpara, Lect. In Comp. Engg. Computer Dept,
557. Smt. Kishoritai Bhoyar College of Pharmacy,
558. Sree Narayana Guru Institute of Science & Technology (SNGIST)
559. Sri Varalakshmi Polytechnic
560. Srijyothi Polytechnic
561. Students of MACE
562. SVIMS
563. Teaching Faculty in Savitribai Phule Pune University & PDVVP, Vishwabharati, G.H. Raisoni, Adsul, Jilha Maratha Engineering College, Ahmednagar, MS
564. Technical Education Welfare Professional Team Members
565. The Chairman, Association of Technical Professional Institutes, Madhya Pradesh, Bhopal
566. The Chairman, Baba Loknath Institute of Pharmacy Sciences & Research Centre, Sagar, MP

567. The Chairman, KKC College of Engineering & Technology, Ariyalur Distt: TN
568. The Chairman, Sona College of Technology, Salem, TN
569. The Chairman, Thanjavur Regional Private Colleges Management Association, Thanjavur, TN
570. The Co-ordinator, Association of Management of Coimbatore Anna University Affiliated Colleges, Coimbatore
571. The Director, G. Pulla Reddy Engineering College, Kurnool, AP
572. The Director, Mohandas College of Engineering & Technology, Thiruvananthapuram
573. The Director, Moradabad Institute of Technology, Moradabad, UP
574. The Principal, Baba Loknath Institute of Pharmacy Sciences & Research Centre, Sagar, MP
575. The Principal, SKR Engineering College, Chennai
576. The Secretary, Karnataka Private Polytechnic Association, Bangaluru
577. Visweswaraiah Polytechnic
578. Wasim Ansari
579. Wg. Cdr C.B Prasad (Retd.)
580. Wg. Cdr. (Retd.) GVSS Sastry, Hyderabad

Schedule of meetings held by the Committee

S.No.	Date	Venue	Agenda
01.	29-11-2014	AICTE Hqrs.	• To Fix the Dates of Meetings • To finalise the list of invitees in the future meetings • To discuss the tentative format of the report • To discuss the things to do, discussion points • Presentation by the Chairman, AICTE • Discussion on the jurisdiction of UGC and AICTE and finalization of view thereon
02.	06-12-2014	AICTE Hqrs.	• Meeting with the persons associated with NBA • Meeting with the Management Experts • Discussion among the members of the Committee
03.	17-12-2014	AICTE Hqrs.	• Meeting with Directors, IITs • Meeting with Directors NITs • To discuss the Selection process of the Chairman, AICTE • Discussion among the members of the Committee
04.	27-12-2014	AICTE Hqrs.	• Meeting with Directors, IIMs • Meeting with Directors, IIITs, NITTTRs • Meeting with Representatives of Industry (FICCI, ASSOCHAM, NASSCOM and CII • Discussion among the members of the Committee
			• Discussion among Members of the Committee • Important Issues raised in the previous meetings • Finalisation of a tentative approach of the Committee to the various issues before the

05.	28-12-2014	AICTE Hqrs.	Committee. Discussion on notes circulated by the Chairman and Members of the Committee on the subject. • To discuss further course of action • To finalise the dates of the Meetings of the Committee for the month of January 2015
06.	02-01-2015	AICTE Hqrs.	• Meeting with former Chairmen, Vice Chairmen and Member Secretaries of AICTE • Meeting with Chairman, Vice chairman, Advisers and Directors of AICTE • Discussion among Members of the Committee
07.	20-01-2015	AICTE Hqrs.	• Meeting with the Chairman, Vice Chairman and Secretary, UGC, Director, NAAC, Bangalore • Meeting with the persons from Skill Development • Meeting with subject matter Councils • Discussion among Members of the Committee
08.	24-01-2015	IIT Chennai	• Meeting with Secretaries (Technical Education), Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, Telanganna • Meeting with Vice Chancellors of Universities running technical education programmes, Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, Telangana • Meeting with Self Financing Colleges and Industry representatives in the region • Meeting with Rating Agencies, Shri T.V. Mohandas Pai of Manipal Foundation and Quality Council of India • Discussion among Members of the Committee
09.	25-01-2015	IIT Chennai	• Discussion among Members of the Committee
10.	09-02-2015	AICTE Hqrs.	• Meeting on Teachers' Training • Meeting with Secretaries/Nominee(s) of the Scientific Organisations • Discussion among Members of the Committee

11.	18-02-2015	AICTE Hqrs.	• Discussion among the Members of the Committee • Meeting with Principal Secretary/Secretary dealing with Technical Education in the States (other than Southern States) • Discussion among Members of the Committee
12.	22-02-2015	AICTE Hqrs.	• Meeting on Distance Education • Meeting with various experts associated with Technical Education • Discussion among Members of the Committee
13.	26-02-2015	AICTE Hqrs.	• Meeting with Vice Chancellors of the Technical Universities • Discussion among Members of the Committee
14.	05-03-2015	AICTE Hqrs.	• Discussion among Members of the Committee
15.	13-03-2015	AICTE Hqrs.	• Discussion among Members of the Committee
16.	14-03-2015	AICTE Hqrs.	• Discussion among Members of the Committee
17.	24-03-2015	AICTE Hqrs.	• Discussion among Members of the Committee
18.	31-03-2015	AICTE Hqrs.	• Discussion among Members of the Committee
19.	06-04-2015	AICTE Hqrs.	• Discussion among Members of the Committee
20.	14-04-2015	AICTE Hqrs.	• Discussion among Members of the Committee
21.	22-04-2015	MHRD	• Presenting the Report to Secretary (HE) MHRD
22.	May 2015	MHRD	• Presentation of the Report to Hon'ble HRM

List of acronyms

- **ABET** - Accreditation Board for Engineering and Technology, Inc.
- **AICTE** - All India Council for Technical Education
- **AIMA** - All India Management Association
- **AIU** - Association of Indian Universities
- **ASSOCHAM** - The Associated Chambers of Commerce and Industry of India
- **ATR** - Action Taken Report
- **BOAT** - Board of Apprenticeship Training
- **CABE** - Central Advisory Board of Education
- **CARE** - Credit Analysis & Research Limited
- **CAS** - Career Advancement Scheme
- **CAT** - Combined Aptitude Test
- **CET** - Combined Entrance Test
- **CBSE** - Central Board of Secondary Education
- **CII** - Confederation of Indian Industries
- **CoA** - Council of Architecture
- **CRISIL** - Credit Rating Information Services of India Limited
- **CSIR** - Council of Scientific & Industrial Research
- **DAE** - Department of Atomic Energy
- **DBT** - Department of Bio Technology
- **DEC** - Distance Education Council
- **DG** - Director General
- **DRDO** - Defence Research Development Organisation
- **DOS** - Department of Space
- **DST** - Department of Science & Technology

- **DTE** - Directorate of Technical Education
- **EC** - Executive Committee
- **EFIP** - Early Faculty Induction Programme
- **FD** - Faculty Development
- **FDP** - Faculty Development Programme
- **GATE** - Graduate Aptitude Test in Engineering
- **GDP** - Gross Domestic Product
- **GRE** - Graduate Record Examination
- **HMCT** - Hotel Management and Catering Technology
- **IAMR** - Institute of Applied Manpower Research
- **ICAR** - Indian Council of Agricultural Research
- **IGNOU** - Indira Gandhi National Open University
- **IIIT** - Indian Institute of Information Technology
- **IIM** - Indian Institute of Management
- **IISER** - Indian Institute of Science Education and Research
- **IIP** - Industry Institute Partnership
- **IIPC** - Industry Institute Partnership Cell
- **IISc** - Indian Institute of Science
- **IIT** - Indian Institute of Technology
- **INAE** - Indian National Association of Engineers
- **IPR** - Intellectual Property Rights
- **IRMA** - Institute of Rural Management, Anand
- **ISRO** - Indian Space Research Organisation
- **ISTE** - Indian Society for Technical Education
- **JEE** - Joint Entrance Examination
- **JNTU** - Jawaharlal Nehru Technological University
- **MBA** - Master of Business Administration
- **MCA** - Master of Computer Applications
- **MHRD** - Ministry of Human Resource Development

Technical Education in India
A FUTURISTIC SCENARIO

Report of the AICTE Review Committee, 2015

सत्यमेव जयते

Ministry of Human Resource Development
Government of India
APRIL 2015

- **MIT** - Massachusetts Institute of Technology
- **MOOC** - Massive Open Online Course
- **MODROBS** - Modernization and Removal of Obsolescence
- **MOU** - Memorandum of Understanding
- **MSME** - Ministry of Micro, Small & Medium Enterprises
- **NAAC** - National Assessment and Accreditation Council
- **NAFETIC** - National Facilities in Engineering and Technology with Industrial Collaboration
- **NASSCOM** - National Association of Software and Service Companies
- **NIOS** - National Institute of Open Schooling
- **NSQF** - National Skill Qualification Framework
- **NVEQF** - National Vocational Education Qualification Framework
- **NBA** - National Board of Accreditation
- **NCFE** - National Centre for Futuristic Education
- **NCHMCT** - National Council for Hotel Management and Catering Technology
- **NCVT** - National Council for Vocational Training
- **NIT** - National Institute of Technology
- **NITTTR** - National Institute of Technical Teachers Training and Research
- **NMEICT** - National Mission on Education through ICT
- **NOC** - No Objection Certificate
- **NPE** - National Policy on Education
- **NRA** - National Rating Agency
- **NSDA** - National Skill Development Agency
- NSDC - National Skill Development Corporation
- **NTA** - National Testing Agency
- **NTMIS** - National Technical Manpower Information System
- **PCI** - Pharmacy Council of India
- **PGDBM** - Post Graduate Diploma in Business Management
- **PGDCA** - Post Graduate Diploma in Computer Applications

- **PGDM** - Post Graduate Diploma in Management
- **PIL** - Public Interest Litigation
- **PWD** - Public Works Department
- **QEEE** - Quality Enhancement in Engineering Education
- **QIP** - Quality Improvement Programme
- **R&D** - Research and Development
- **REC** - Regional Engineering College
- **RO** - Regional Office
- **SKP** - Skill Knowledge Provider
- **SSC** - Sector Skill Council
- **SME** - Small & Medium Sized Enterprises
- **SPA** - School of Planning and Architecture
- **TEQIP** - Technical Education Quality Improvement Programme
- **UGC** - University Grants Commission
- **VSAT** - Very Small Aperture Terminal
- **WCD** - Women and Child Development
- **XLRI** - Xavier Labour Relations Institute