
Analysis of the Effect of Engineering Education in Nation Building in India

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Abstract: India has been a permanent member of the Washington Convention since 2014, and TIER-I institutions are required to promote universal accreditation, recognize qualifications, and establish connections with technical institutions around the world to obtain program accreditation. In additional words, technological institutions should struggle for the nonstop development of the numerous mechanisms of the machine: inputs, physical capitals, statistics, people, capital and resources, prospectus and learning processes, manufacturing, productivity, work-life relationships and feedback mechanisms. India offers the third largest network education, but faces accessibility, justice and affordability issues. The country's main challenges include: converting demographic income to demographic dividends, cumulative gross enrollment ratio (GER) for higher education, and equitable access to qualifying education in other provinces and distributions. The Indian government has taken a lot of steps in this course. For specimen, establishing the state accreditation committee as an independent body for launching teacher training, funding student projects, supporting ICT, etc. Also there is curriculum and development process for education connection with the working world, full use of equipment, research environment, recruitment in educational institutions, technical policy upgrade, raising standards and adopting an institutional approach to achieving excellence. This document aims to show such types of initiatives that can help organizations improve their efficiency and strive for excellence.

Keywords: Academics, Engineering, Higher education, Excellence, Institutions, Technology, Development.

INTRODUCTION

India is the second country with the largest population and a nation of youngsters. Of the 1.2 billion inhabitants 672 million citizens are in the 15 to 64 year age range. This expected a piercing decline in dependence in India the proportion for the next 25 years that will be a big one Indian 'Demographic Dividend.' This teenage populace appropriate knowledge and skills must be provided to participate in and contribute significantly to the development of both the national and global economies. India has the third largest education system in place yet faces exposure, capital and efficiency issues. Large enrolment at higher and professional point, ratio (GER) is just 22 percent and thus there is room to grow further Professional Skills. The Indian government has set a target for achieving student enrollment of 38 percent by 2020. The Biggest obstacles a country faces include: to transform demographic gain to demographic dividend, increase higher as well as technical education GER, supplying equal opportunities connection to Higher Training in different States classes, including human capital for industry, nature conservation and conversion and building infrastructure [1].

Indian sophisticated education saga since the 1965s complex, diversified and reproduces the evolution of the nation through time. India's advancement of tutoring has, for most of the time lagged behindhand economic and social developments evolution. As in India itself, the facts of higher education are inconsistent. India holds the second in the world in 2014 principal higher education program in terms of number of graduates, having just overhauled the United States in registrations, with 22 million post-secondary students enrolled, more than 35,500 colleges and 574 universities attended [2].

More than half of the biosphere's is estimated to be post-secondary institutions are in India-many of them the colleges are insignificantly small. About this 20%, the 18- to 22-year-old cohort is in post-secondary education — with a target of 25% by 2018 and 32% by 2023—an incredibly optimistic goal. Levels for dropping out are high, with many failing to enter the organization full a Certificate. Price is usually weak, even if there are big islets of excellence – and the program complete it's a sea of unevenness , no university in India scores well on any of the sophisticated education institutions Ranks [3]

India, like a lot of developed countries, was inundated by basification – the development of higher rapidly employments in education that are the consequence of an overwhelming demand for access by increasing sections of the population. Increased challenges have magnified India access demand, combined with population

overall rise. In no nation has it followed rapid expansion by improving complete quality, and in this respect India is no different from many other countries, respectively. India had numerous advantages when it became independent in 1947, but could not capitalize on them. English was the closely worldwide higher education medium, giving India immediate external links; scientific knowledge access, besides textbooks. Though India, rather small, had developed a fairly mature higher educational program, with many prestigious universities and specialized institutions at the top and an acceptable number of scholar colleges, some of them worldwide standards. Whereas access has been limited to a unimportant the town elite, and most institutions of higher education situated in the metropolitan parts, universities and colleges could be originate in all of India [4].

Although the scheme has grown pretty quickly over most post-independence periods, population increase and the development of primary and secondary education have demonstrated that demand could not be met by undergraduate education. Public education was highlighted in accordance with world thinking on learning and support and not on higher education. Globally, as registrations rose, quality dropped significantly in most developing countries. In recent times, despite substantial rhetoric regarding India's 'take-off' of higher education, and the link between low levels of higher education and recent economic growth, evidence has shown that population development has had a significant impact on continued to improve higher education. Indeed, it has argued that if higher education is not improved, India may lose the advantage of its "demographic dividend" from a large youth population that could lead if well-educated continued economic development [5].

Some of the broad trends that are worth looking at characterize Higher Education in India. Those are shown in no particular order of position. However, they are connected and establish over time a pattern of expansion. Like most emerging countries, India has had a long experience the Colonial Period. British rule over much of the subcontinent spanned several centuries longer than most other countries' colonial practice. British-style higher education dates back to the establishment of many colleges in 1823. In 1858, colleges were recognized at Bombay, Calcutta, or Madras, around the same period that advanced education was extended in England beyond Oxford and Cambridge [6].

Though the British were usually not ardent supporters of in India higher education was not prevented from establishing it. Higher education has organized as share of foreign policy after a laissez-faire period, ensuring the English was the language of teaching and that of the society and the institutional system conformed to British strategy and trends. England was more supportive of higher education in India than in its colonial property in Africa. The colonial establishments spent few possessions on higher education, and Indians provided the impetus for the modest expansion of higher teaching in India throughout foreign rule. Indeed, efforts have been made to keep small enrollments to prevent a subversive intelligentsia or unemployed graduates from emerging. Both of these areas were failures, at least in part, as the independence movement was being led by educated Indians. The British wanted to ensure that the college and university students were sufficient to meet the requirements of the colonial government, rather than the developing Indian society and industry. There were 19 Universities at the time of independence and 695 schools, with overall enrollment fewer than 260,000 Pupils. By Previously Equal Standards mid-twentieth-century developing countries; India glowing located. It had a moderately wide range of universities, although few were vocational or scientifically oriented. The quality of this little thing was comparatively high. While only serving a tiny age cohort ratio well below 1 percent, India had clear higher education institution structure on what to make. The challenge of tackling expansion demands, mutual with heightened political and other stresses education, meant that it could not take advantage of current assets to construct for quantity and quantity [7].

Today's frugalities are conquered by service businesses; the gross national Indian usually product has operation proportion than manufacturing. The enhanced rise in this subdivision is mainly due to the liberalization and privatization weights. In the past, for instance, instruction, fast food, retail, communications, transport and investment sectors showed higher development ten years. In particular, the country's engineering education sector is observing a rebellion with the appearance of a whole new class of breadwinners of education, including private institutions; Providers of distance education, self-financing courses in state establishments, foreign educators, etc. Simply meeting or beating past performance with penetrating competition in this sector today will not result in the level of enhancement needed to remain enough inexpensive [8].

The limited number of state-funded manufacturing teaching institutions (EEIs) in India and the government's withdrawal of funding for engineering education have caused the secluded institutions burgeoning. Therefore, the involved shareholders have a wide excellent of options to choose from. Consequently, improvements need to be implemented in the educational processes for the development of a sound education system. In such an active environment, Total Quality Management (TQM) appears to be one of the effective methods for addressing not only business challenges but also stakeholders (Internal as well as exterior). In this light, the contemporary paper is an attempt to research the implementation of TQM in the Indian scenario engineering education sector, with a method to assessing its production linkages. The purpose of this paper is to use interpretive structural modeling (ISM) to identify and apply TQM principles and to classify them according to their driving command and dependency [9].

Washington is a regular member agreement in June 2014 and for starters, NBA Undergraduate Certified (UG) programs offered by the autonomous research schools, and colleges university sections including constituent colleges (Tier I) are eligible for acknowledgement by other university signatories accord with Washington. System Accreditation should facilitate worldwide support and the movement of engineering institutes students around the world. A great number of engineering institutions will aspire for this continual improvement to the regulations of acknowledgement [10].

Quality Movement In Education

Quality drive started in 1950. In 1986, it has been set a method to total management of quality Connecting 14 measures to increase the performance of a company or industry. Excellence was described in several different ways. It also have been described quality as a requirement enforcement. In terms of project, conformance, obtainability, protection and field usage, quality has been defined as capacity for use in context of design, conformance, availability, safety as well as field use. He based on operational approaches and top-down management. Quality has often been described as customer happiness or customer delight or customer satisfaction at reasonable prices. According to Macdonald in addition to Piggot, “Quality is characterized as appreciating the customer by consistently satisfying and enhancing accepted requirements.” It was reported that the concept of quality as “compliance with requirements, the totality of the characteristics and characteristics of a product or service which underpin its capacity to meet the specified and implied needs.” Quality is a subjective definition and intrinsic according to ISO 9000. The product or service characteristics are contrasted with the terms and conditions. Quality is a continuous process of improvement and is not an absolute thing, but a relative one. The main concern to price advancement is about analyzing the process and not the product or the outcome [11].

U.S. politicians learned in the mid-1980s that the American enterprises had to concentrate on quality to succeed in a globally competitive with ever-expanding market. In 1987, the Malcolm Baldrige Award was created in credit of his contributing to quality changes. The requirements are: Management, Strategic Planning, Customer Service, Evaluation, Research & Information Management, Employee Development, Service and Performance of Operations. After that, the scope of such awards has broadened to include the healthcare industry, training agencies and charitable organizations [12].

In Europe, the European Quality Control resources effectively and efficiently instituted Certificates of Excellence based on requirements of customer as well as market focus, Leadership, Strategic Planning, and Knowledge of assessment, study & management, inside focus on people, organizational outcomes, social influence and managing Tool. The aim of the EFQM the Achievement Award is for outstanding performance both private, public and non-profit organizations. In their report 'In Search of Quality' Peters and Waterman given eight elements building excellence in every one organization focused on lessons learned from best running American company. These key elements include: an intervention bias, Similar to the customer, Flexibility and innovation, People's prosperity, Hands on, value oriented, Knitting, Simple shape, lean staff and loose-tightened assets at the same time [13].

In the 1990's there were competitions for excellence in education Founded. Baldrige Education excellence criterion in 1998, was established. The criteria cover seven Elements: management, strategic thinking, students and consultants the emphasis, evaluation, interpretation and awareness of the stakeholder’s process management, faculty as well as staff focus and the effects of the success. The parameters allow for dynamics Continuous development Process [14].

Table 1: The details of NIRF Ranking 2020.

Ranking	Institute name	City
1	Indian Institute of Technology Madras	Chennai
2	Indian Institute of Technology Delhi	New Delhi
3	Indian Institute of Technology Bombay	Mumbai
4	Indian Institute of Technology Kanpur	Kanpur
5	Indian Institute of Technology Kharagpur	Karagpur
6	Indian Institute of Technology Roorkee	Roorkee
7	Indian Institute of Technology Guwahati	Guwahati
8	Indian Institute of Technology Hyderabad	Hyderabad
9	National Institute of Technology Tiruchirappalli	Tiruchirappalli
10	Indian Institute of Technology Indore	Indore
11	Indian Institute of Technology (BHU) Varanasi	Varanasi
12	Indian Institute of Technology (Indian School of Mines)	Dhanbad
13	National Institute of Technology Karnataka	Suratkal
14	Anna University	Chennai
15	Vellore Institute of Technology	Vellore
16	National Institute of Technology Rourkela	Rourkela
17	Jadavpur University	Kolkata
18	Institute of Chemical Technology	Mumbai
19	National Institute of Technology Warangal	Warangal
20	Amrita Vishwa Vidyapeetham	Coimbatore

The eleven core values that are key to structure excellence are: innovative management, learning-centered schooling, administrative and individual development, appraisal of students, staff and stakeholders, creativity, emphasis on the future, innovation management, de facto management, social accountability, emphasis on results and value creation and program perspective [15]. Another distinguished prize is the European Foundation for nominations for quality control, based on requirements consisting performance Feedback, consumer attention, Governance and consistency, Leadership by Procedures and facts, advancement of people and their implications, Continuous research, creativity and betterment Production of partnership [16].

Times Higher Education lists universities from around the world. Judiciously controlled performance measures are used for Provide the most detailed and realistic comparisons possible. Such measures are concentrated in five regions. Those five domains are given as: teaching: learning environment (32% of educational environment Overall score in the ranking), Research: volume, revenue and Reputation (32%), Citations: influence of research (32%), Business income: creativity (2.6%). The percentage), the foreign perspective: staff, students and research (7.5 percent) [17].

QS World University Rankings aims mainly to support scholars make a knowledgeable comparisons between themselves options for Foreign Research. The parameters used give academic credibility weighing (40 per cent), employer reputation (12%), Faculty/Student Ratio (20%), Quotation per person faculty (20%), Foreign Student Percentage (6%), and ratio of Staff International (5%).

Table 2:

Ranking	University Name
1	Indian Institute of Technology ,Bombay
2	Indian Institute of science, Bangalore
3	Indian Institute of Technology ,Delhi
4	Indian Institute of Technology ,Madras
5	Indian Institute of Technology ,kharagpur
6	Indian Institute of Technology ,Kanpur
7	University of Delhi
8	University of Hyderabad
9	Indian Institute of Technology ,Roorkee
10	Indian Institute of Technology ,Guwahati

A group of 3,000 Universities are analyzed by an expert team besides ranks in the top 400. Each foundation is named as a whole scale of points and graded according to some other institutions. The World Universities Academic Ranking (ARWU) utilizes the following indicators:

- Education quality: An organization's alumni Nobel Award winners and Sports Awards (10 per cent)
- Faculty qualification: (a) the staff of the winning institution Nobel Prizes and Medals in Fields (21%) and (b) often cited scientists in 22 diverse subject areas groups (20 per cent)
- Work results: (a) Papers written in Nature and Science (20 per cent); and (b) scientifically indexed papers citing extended index besides social sciences index of quote (20 per cent)
- Quality per capita: Academic per capita institution's efficiency (10 per cent)

The School Brilliance Model is also targeted towards similar requirements covering: leadership, management of employees, strategic planning, processes focused on students, results of staff, administrative & performance, Relationship & Community Performance, and Main metrics of success [18]. Professional institutions in India, with the exception of Bombay as well as Roorkee have no role in Technology the top 500 universities in world university rankings is concerned. Education quality awards are gaining those awards, however, have still not organized the excellence-assessment criteria. The various Models of Excellence suggested it contains several similar elements. There needs to be a take consideration of the framework establishing innovation in advanced education [19].

Technical Education System: Engineering Education

There has been enormous increase in Academic institution over the last two decades. Currently, there are 81 institutions with central funding; and 8562 degree with focus on technical institutions including diploma level 3524 accepted institutions. The graduation potential and diploma standard institutions amount to 3.4 million. 3479 institutions out of 8562, deliver programs in Engineering in addition to Technology. In addition to these, the Indian Development Institute, offered by regional technical institutes and universities undergraduate, Diploma and Doctoral programs Technology & Engineering [20].

In addition, skilled workers, educated by the program leads to economic development and country development. The standard of education degree is strongly criticized and affects all investors, including strategy makers, managers, educators, scholars, industry as well as society. Two of the system's key disadvantages are:

- Hazardous development of the program of professional education
- Lack of Program Value

- Low performance consistency
- Inadequate physical capital & inadequate full usage
- Faculty vacancies
- New students entering the professorship
- Teaching procedures based on the instructor
- More focus on theory
- Undue reliance on written examinations
- Assessment program to promote rotary memorization on the student part
- Low Student Reliability, Validity & Objectiveness Assessment
- Low Performance Acceptable

The mission ahead is to develop excellence in the setup. The complete refurbishment of training of engineering [21].

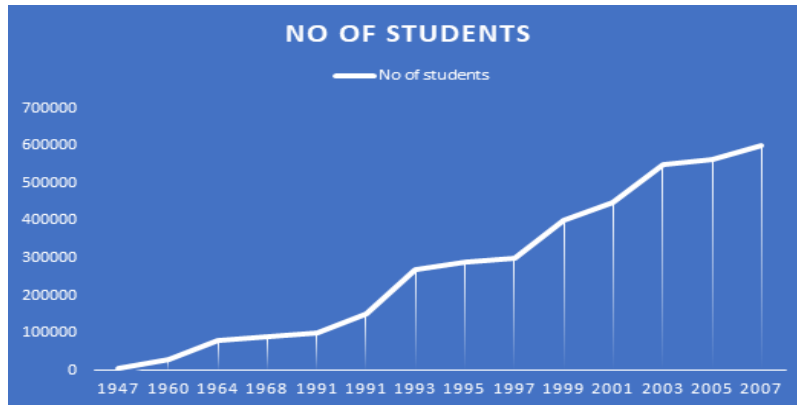


Fig. 1: Number of student in engineering in India over the year

Initiatives By Government Of India To Recover Quality

India's Government has already taken a range of steps in this respect steering. For instance, declare the National Board as self-employed enterprise Regulatory Body All India Technical Education Council (AICTE), start and preparation of the mission instructors, submission on Polytechnics under organized skills intervention growth, stimulating the National Education through ICT etc., to enhance higher excellence and Country technical education [22]. The National Accreditation Board has been given full authorization autonomy to accredit computer systems & technology and the Board are likely to be developing national branches and reinforce the current system to accredit all programs offered by the educational colleges. Just 20-25 per cent of programs have been approved at present [23]. The teacher and training mission was launched to improving the teachers' quality to fulfill the needs of education programs, maintaining all current educational systems teachers are provided with a qualified continuing education progress, and strategies to attract and formulate holding talented young people into the teaching profession [24].

The government agreed to back the state administrations/Union Territories to launch polytechnics as part of the submission on polytechnics under concerted capacity growth action. a one-time monetary assistance incomplete to 11.3 crores shall be given to state governments/UTs to meet the cost of capital in creation of new polytechnics in the 300 unserved and under-served areas. Under the National Education Mission, through ICT (NMEICT), sponsored by human resources ministry progress, Indian State, a proper balance between content production, important field study bringing education and networking to combine our awareness is being pursued with the new advances [25]. The students' summer internship in first universities, professors of main institutions like IITs, IIMs, collectively providing online classes, 1000 scholarships a year for eligible candidates to pursue doctorate in CSIR / DRDO laboratories or other prestigious institutions.

Strategies To Improve Quality Of Various Sub-Components Of The System

It is well known fact for any country even for India also that India could spring up as a information power only where a suitable higher education architecture is mounted. Indian youth showed up their inventiveness and Past Power Lifelong learning that reservoirs this innovation capability will unleash the India's demographic dividend has latent potential. That is fragment of higher knowledge and academic teaching passing through a crucial process is a must for the program for enhancing the efficiency of its various sub component [26]. The standard of engineering education with a basification it's gone down from the students taking entry. The entrance exams lost their meaning and the students lacked the awareness, skills and attitudes which are important for pursue a degree in engineering. The following techniques can be used help to enhancing input quality:

- Admissions test should include a constituent of power and students will obey branch of engineering that they have that aptitude for.
- A score sawed-off should be made the decision so that only admitted capable Engineering graduates.
- Bridge courses to fill in gaps should be offered that exists in the information and skills needed to do so. Such courses are available online.

Curricula must correspond to the needs of customers, fulfill student and social aspirations. The education curriculum of various technical programmes, and information requires urgent attention despite changes are held in the sciences, technology, workplace, internationalization, as well as globalization [27].

- The prospectus should be aligned with diploma characteristics as agreed in Washington Treaty
- Industrial partnerships must income the lead studying and identifying manpower spectrums profile of competences of engineers at different levels and through the specific branch divisions. The National Council for Developing Skills already has work in that direction began and twenty-one sectorial skills councils were set up under the Skill Development Mission.
- Technology forecasting commissions consisting of technologists and academics shall be formed for different disciplines for predicting emerging ones technologies covering different disciplines.
- Companies can offer the students electives. Along with example: Infosys offers Business courses intelligence, the preparation of business capital and creation of mobile applications in Sona university Bangalore, Technology. Such sort of arrangement is going to help students gain knowledge and skills in specialized fields.
- There has to be a mechanism for obtaining feedback from employer monitor the effectiveness of pass-outs, to introduce curriculum changes.
- The alumni must have formal and informal input are collected to implement process improvements.
- All the curricula should be modular in design with credit-based rating framework for give flexibility and allow for self-pacing students.
- Implementation of a variety of specializations in each discipline allows the students to choose from Courses according to their own interests. Possible provisions for core and open choice courses. Open Choices on higher level should be offered. Before biding Open electives, learning all of the core courses.
- Humanities & social-science lessons, management, work ethics & principles, engineering, Sustainable Development, there has to be technical and project management included in resume.
- This should include topics such as science and humanism sensitizing students to social needs and science can be instrumental in meeting those needs.

CONCLUSION

The engagement and partnership of industry academic institutions for higher learning institutions should be improved as well as the exchange of expertise and know-how, collaboration research and partnership projects providing and conducting seminars and conferences. Business and high schools collaborate in learning outcomes. Institute-level implementation of the above methods to boost performance and pedagogy of technical excellence. In order to achieve desired outcomes, improvements must be implemented simultaneously in separate subcomponents of the program. One cannot be positive about a breakthrough standard in the light of the realities of Indian educational contexts. It seems very doubtful that any of the new colleges in Germany will soon achieve world class status. Even if the Chinese-style Indian government were to accept thousands of established institutions in order to make massive investments, it would require significant changes in management, governance, and other fields.

As others have private psychiatric higher education institutions, many of the conventional, non-profit community schools offer outstanding undergraduate education. Some of the novel technology universities seem very committed to their educational mission. At the same time, Indian market is becoming increasingly sophisticated, requiring some universities and colleges of existing world-class institutions to compete with both the greatest in the game if potential needs for resources are to be fulfilled. In parallel, if India is to take benefit from its "demographic dividend," and traditional Universities, appropriate access and equity and it must be the thousands of colleges affiliated with them improved and reformed-this may be the biggest Indian higher education faces a challenge.

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