



“A STUDY ON PRESENT SCENARIO OF ENGINEERING EDUCATION IN INDIA”

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Abstract:

Engineering education is the process of acquiring general and specialized knowledge by means of study and learning to development intellectual powers of reasoning and judgment. Human education growth and development is a life – long process as it includes acquisition of skills for executing various professional and vocational functions. Examining the progress of engineering courses in British India we can say that India grew up in Engineering after Independence, only difference is that in India the growth in technical education remained limited and slow as compared to western nations.

At the time of Independence there were only 20 Universities and 500 Colleges, whereas if we compare today, we have more than 1056 universities and 4151 B.Tech colleges, out of which 594 are government colleges whereas 3548 are private colleges. At present, a total of 21 IITs, 31 NITs and 25 IIITs are spread across the country, but most of the students throughout the country are not aware about new courses or degrees, especially those who are living in remote areas. This gives a brief idea about the availability of hung scope for applying new publicity Activities as well as Marketing Strategies and plans on national level.

Introduction:

India has one of the country leaders in the potential to be global technology in areas like software, automobiles, chemicals and engineering equipment's. Since freedom the growth of engineering education in India has become a critical issue. In the creation of skilled manpower and enhancement of industrial productivity as well as in the improvement of the quality of life. Technical people plays dominant role in human resource development of India. Technical education encompasses various programmers in management, town planning, hotel management and catering technology, architecture and pharmacy also.

As per observe that, In last few decades, It is seen and evidenced that the number of engineering institutes in India providing technological skills has increased from 30 to 20000 more over the same is with universities. Which has grown in number from 20 to 500 this drastic has made India the third largest growing system in the world. To try the maintain high level standards and the accreditation system provides a measure of educational quality. It keeps the graph of progress going up continuously.

Still, it is a matter of great importance to discuss about the measurement of quality and in the context of unprecedented expansion of higher technical educational institutions and various programmers. There is a great deal of discussion in the country about the newest disciplines, entry and operation of foreign institutions in a variety of forms and desire for global recognition through international accords such as mutual recognition, Washington and other national protocols also. Engineering education is play very important role an essential input for national development as well as growth of the economy and improving the quality of life of the people

Objective of the Research:

The main objectives of the Research:

- (i) To study the present Scenario of Engineering Education systems in India.
- (ii) Formulating the national education policy of India and to ensure that it is implemented.
- (iii) Find out the Engineering Technical Committees which are working for the Development of Engineering profession.
- (iv) Find out the growth of intake of technical institutes in India.
- (v) Focused on the role of Human Resource Development which is balancing the socio economic fabric of the country.

Data Analysis and Interpretation: Statistics of Engineering Institutes in India and Maharashtra:

Sr. No.	Year	Engg. Institute in India	Engg. Institute in Maharashtra
01	2012-13	2578	369
02	2013-14	2580	373
03	2014-15	2593	380
04	2015-16	2560	377
05	2016-17	2504	374
06	2017-18	2453	374
07	2018-19	2350	363
08	2019-20	2304	361
09	2020-21	2241	354
10	2021-22	2185	348
	Total	24348	3673

Table No.: 4.3.2 Statistics of Engineering Institutes in India and Maharashtra:

Statistics of Engineering Institutes in India and Maharashtra: India has one of the largest numbers of engineers country in world as well as the largest number of engineering education institutes and infrastructure are available in the India over all the world. As of 2021, India annually produces fifteen lakh engineering graduates. India's technical education infrastructure includes 2500 engineering institutes. Maharashtra is home to over 600 engineering institutes. Out of these 24 institutes have been ranked by NIRF as top Engineering institutes in India.

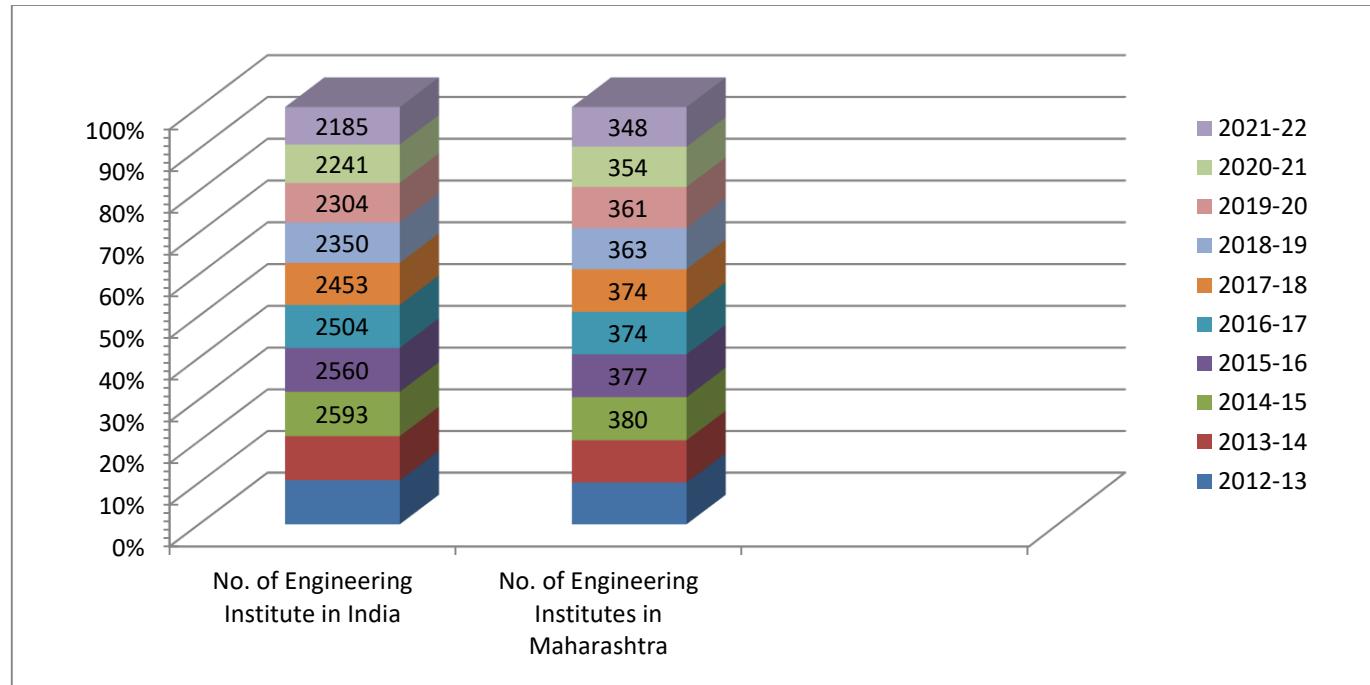


Fig. No. 4.3.2: Statistics of Engineering Institutes in India

Analysis: From above table it is seen that, the number of 2578 .institutes are located in overall in India. In the Academic year-2012-13. And 369 institutes in Maharashtra. In the academic year 2014-15 numbers of 2593 Engineering institutes in India and that time 380 engineering institutes in Maharashtra. After that numbers of collages are decreasing. in academic year -2021-22, number of 2185 are working out of 24348 in India and 348 institutes working in Maharashtra out of 3673.

Growth of intake (UG) of Technical Institutes in India: As per the data given in above table and its graphical representation we can observe the heavy growth in the intake capacity of various institutes. It also indicates the increasing number of students towards the technological field.

Table: 4.4.2 Growth of Intake (Under Graduate) of Technical Institutes in India:

Sr. No.	Year	Approved Intake	Enrollment	Students Passed	Placement
01	2012-13	3458194	2154818	1378898	559529
02	2013-14	3724149	2189595	1504911	613137
03	2014-15	3961610	2142281	1586650	674597
04	2015-16	3836421	2086066	1638870	701705
05	2016-17	3703158	1955664	1715000	723217
06	2017-18	3551957	1895805	1573443	716495
07	2018-19	3392521	1857995	1565074	796394
08	2019-20	3284835	1862360	1316606	798300

09	2020-21	3086307	1689409	0000000	711286
10	2021-22	2975577	1738806	1044926	815223

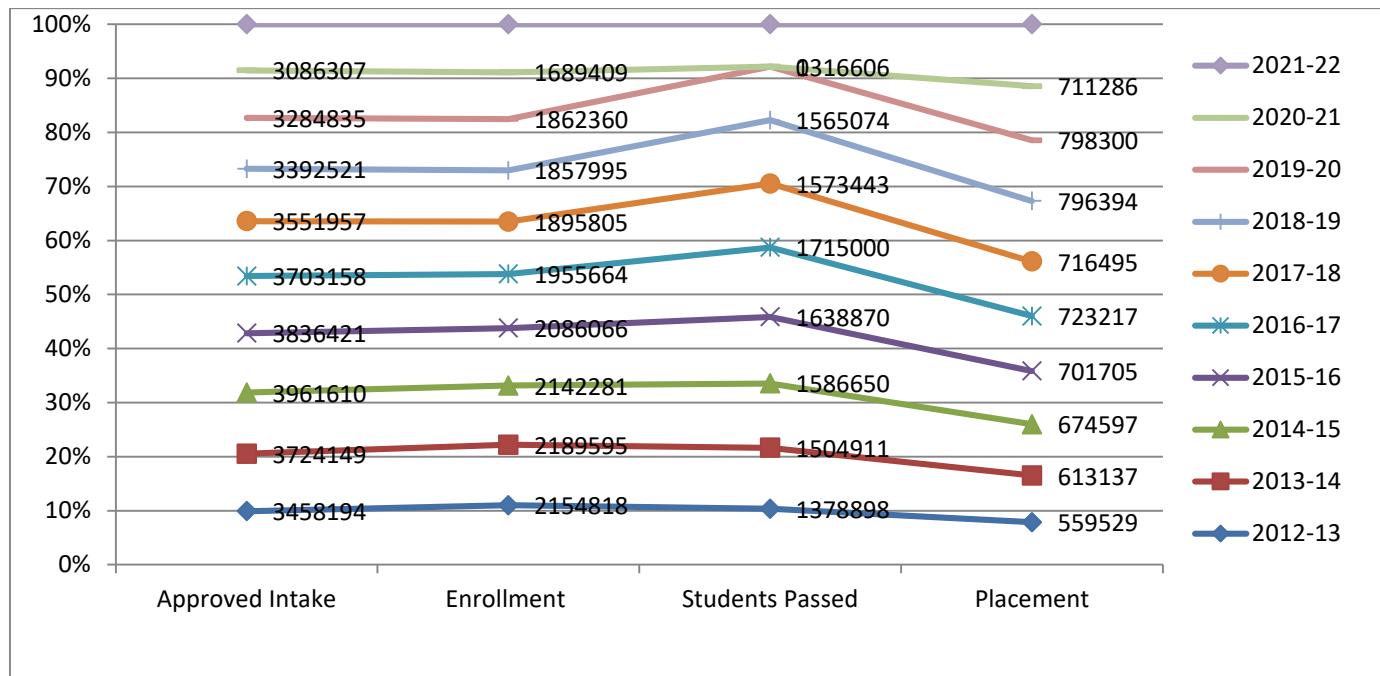


Fig. No. 4.3.6 Graphical representation Growth of Intake (Under Graduate) of Technical Institutes in India.

Growth of Post Graduate, Under Graduate in Tech.Edu.in Maharashtra:

Following Table is showing status of Engineering Institutes including post Graduate, Under Graduate & Diploma of Engineering. From 2012 to 2022 among 10 years records of engineering education is given below.

Table: 4.5.1 Growth of PG, UG in Tech. Education in Maharashtra:

Sr.NO.	Year	PG Institutes	UG Institutes	Diploma Institutes
1.	2012-13	5996	4468	3505
2.	2013-14	6061	4488	3891
3.	2014-15	6007	4497	7779
4.	2015-16	5847	4472	4355
5.	2016-17	5670	4416	4469
6.	2017-18	5504	4396	4585
7.	2018-19	5279	4436	4814
8.	2019-20	5152	4745	5504
9	2020-21	4943	4068	4458
10	2021-22	4789	3628	3994

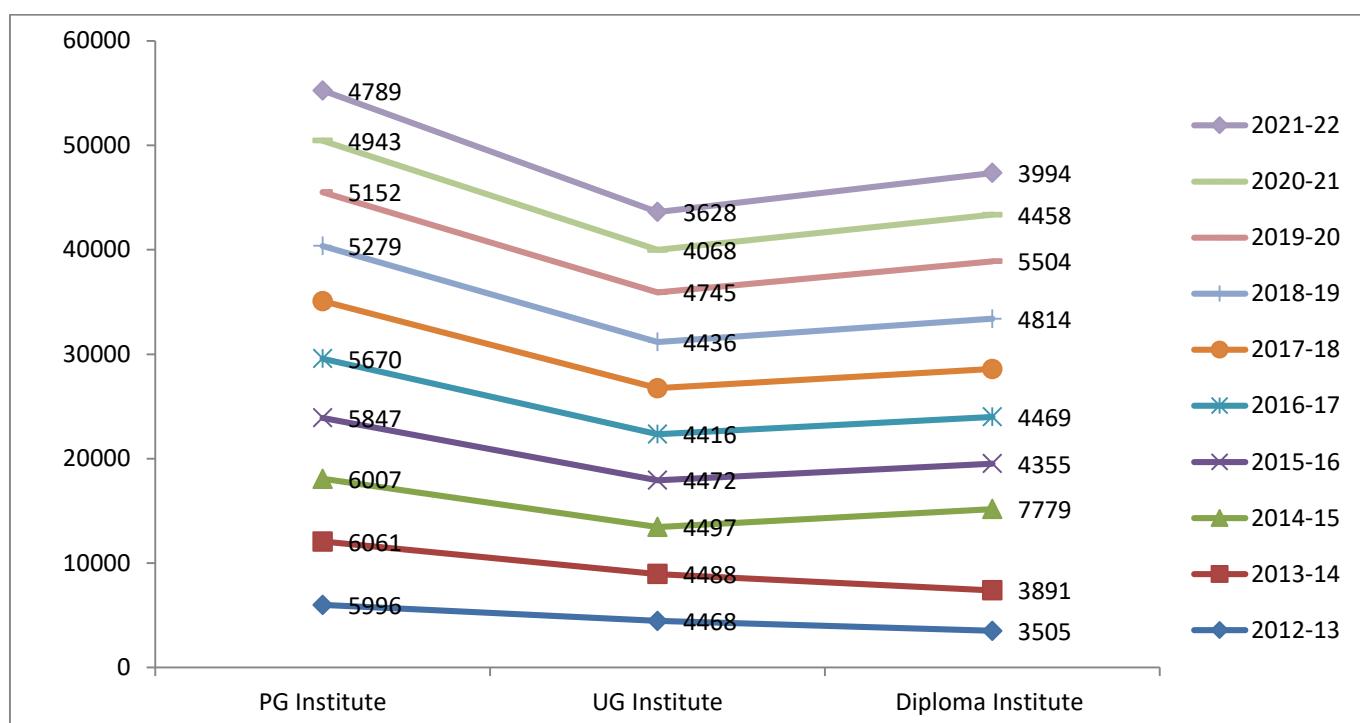


Fig. No. 4.5.1 Graphical Representation of growth in PG, UG and Diploma

Higher Education system in India: India is the third largest country of worlds for the Technical higher education. Since the independence higher education sector has witnessed a tremendous in the number of universities level institutions and college. World Universities ranking 2020 the prestigious quacquarelli Symonds. Indian three universities IIT Bombay, IIT Delhi and Iisc Bangalore have been included in the top 200 institutes.

Issues and Challenges in India's Higher Education Sector:

Enrolment: 25.2 (%) Present of the Gross Enrolment Ratio (GER) of India in higher education.

Equity: There is no equity in GER among different sections of society. GER for males (26.3%), females (25.4%) and SC (21.8%) as well as ST (15.9%). The density of institutes varies from number of 7 % and in Bihar to 59%, as well as in Telangana state as compared to All India average of 28%.

Infrastructure: No Good infrastructures are available for higher education in India. Due to the low budget and corruption as well as education lobbying by vested interest group they call Education Mafias.

Faculty: Shortage of faculty leads to Ad-hoc expansion even in the premier institutions. The Pupil to teacher ratio though has been stable in the country (30.1), however, it needs to be improved to make it comparable to USA (12.5:1), China (19.5:1) and Brazil country.

Out-dated Curriculum: As per observe that, There is a wide gap between industry requirements and universities curriculum and that is the main reason for the low employability of graduates in India.

Research: Some of the factors affecting the research ecosystem in India. India's investment in R&D has remained constant at around 0.6% to 0.7% of India GDP. This is below the expenditure of countries like the US (2.8), China (2.1), Israel (4.3) and Korea (4.2).

Importance of the Study: A historical perspective is necessary for a correct assessment of the present state of Technical education in the country and the problem facing us in the field. Technology in the modern sense of the term made its first appearance in the country in the 19th century, when it was applied to communications, irrigational works and building construction that were of importance at that time. Before World War II, there were only about 11 engineering colleges in the country that offered degree courses in the three main branches of engineering viz. civil, mechanical and electrical. Facilities in other fields as for instance, chemical engineering, metallurgy, mining etc. were extremely limited and only a few institutions offered these subjects. Although some engineering colleges in the country are more than 100 years old, technical education remained almost static for a long time and this condition is reflected in a large measure in the general lack of scientific and technological progress of the country.

Research Methodology and Data Collection: Various data collection tools are used for collecting of the data for this study. The questionnaire method is user for maximum data collection. As well as supplemented by mobile interviews and face to face interactions with respected librarians. Google form also prepped and sanded to librarians on theirs email and what's App. The purpose of the questionnaire was to collect the data regarding general information about the library and information product source and services in selected engineering college libraries.

Present Status of Technical Education in India: After the independence technical education in India progressed and expanded remarkable in the 1950. In the beginning of the freedom only fifty institutes were there with a total intake of 3700 only. The end of the 1990, the numbers of institutions increased seven times to the intake capacity and more than eighteen times of the year 1950 increasing demand of technical underproduction to man power in IT and induction sector and also the out sourced needs of industries in the countries like UK.

Naturally made India the largest producer of technical graduates despite the global slowdown of financial sector AICTE received 886 applications for establishment of new institutions in different states in India in 2009-2010. With the advancement in Technology and development in new areas of Technology has made it necessary to start new courses in the new merging areas to cater to the needs of the industry and society. Non – Conventional Courses at degree and diploma level courses in Industrial Electronics, Computer Technology, Chemical Engineering, Bio-medical Engineering, Construction Technology, Production Engineering etc are started. As per the report of DTE, No. of Technical Institutes is increase. Over last 40 years the number of 724 Technical institutes started.

Recent Initiatives Taken by the Government: Education Quality Upgrading and Inclusion Programme have been recently launched by Government of India: Government of India has declared the five years vision plan of improve the quality and accessibility of Technical Education over the next upcoming five years (2019-2024). Double the Gross Enrolment Ratio in higher education and resolve the geographically and socially skewed access to higher education institutions in India. Position at least number of fifty India institutions among the top 1000 global universities.

Revitalizing Infrastructure and systems in Education (RISE) by 2022: Qualitatively upgrade the research and academic infrastructure in India to global best standards by 2022. Make India into an education hub by making available high quality research infrastructure in India higher educational institutions. To allow access of HEFA funding to institutions like central universities , AIIMS, IISERs and newly created institutes of National importance and without creating any additional burden to the students. Higher Education Financing Agency has been tasked to mobilise cost of 100000 Crores for this for this initiative.

UGC's Learning Outcome-based Curriculum Framework (LOCF): University Grand Commission issued guidelines about the LOCF in the year 2018. The objective of specifying what graduates are expected to understand and able to do at the end of their programmes of the study. This Learning system to make the student active learner as well as teacher a good facilitator.

Graded Autonomy to Universities & Colleges: Graded Autonomy System has been initiated with the categorization based on accreditation scores. Universities will have significant Autonomy to conduct examinations and prescribe evaluation systems and even announce results.

Global Initiative for Academics Networks (GIAN): Global initiative for academics networks are to invite distinguished academicians, entrepreneurs, scientists and the experts from premier institutions from across the world to teach in the higher technical education institutions in India.

All India Survey on Higher Education (AISHE): The main objectives of the all India higher education survey are to identify and capture all the institutions of higher learning institutions on various aspects of higher education system.

National Institutional Ranking Framework was developed in year 2015. The rankings are published annually since year 2016. It outlines a methodology to rank educational institutions across the country based on five broad parameters: i) Teaching learning and resources ii) Research and professional practice iii) Graduation outcomes iv) Outreach and inclusivity and v) Perception etc.

Regulatory and Governance Reforms: Regulatory and governance reforms is to restructure the different higher education regulators like UGC, AICTE, NCTE etc. to ensure effective coordination. UGC Act to give legislative backing to regulatory structure and allow foreign institutions to operate joint degree programmes with Indian institutions. Link University grants to performance and Select Vice-Chancellors of universities through a transparent and objective process system.

Increased Focus on Vocational and Profession Led Education: Including the vocational subjects in mainstream universities to allow for greater acceptance and utility for vocational learning.

Accreditation Framework: Accreditation process is compulsory for all Technical Education institutions. Accreditation process is done through various agencies like NAAC, NBA empanelled through a transparent high- quality process.

Performance Linked Funding and Incentives: All the central universities should develop strategic plans for getting into the top of the five hundred global universities rankings in the next ten years. Funding to these institutions should be linked to performance and outcomes through the Human Resource and development of Maharashtra and newly constituted Higher Education Funding Agency.

Engineering Education Committees and Recommendations: Engineering Technical Committees are working for the development of the engineering profession. The engineering programs and the development of the profession through collaboration with different educational committee's establishments and organizations. In the engineering education the committee will work towards excellence. The motto of to bring the profession into higher levels in research and development as well as focus on the accreditation for the mobility of Engineering professionals, sustainability and globalization of engineers around the world. Following table is showing the summary committees.

Table No. 4.2.1 Summary of Major Committees and Recommendations:

Committee	Title	Year	Recommendations
R.N. Sarkar Committee	Title under the Higher Technical Institutions for the post-war Industrial Development	1985	For the Setting up of Indian Institutes of Technology (IITs)
M.S. Thacker Committee	For the Postgraduate Engineering Education and Research	1959-61	Recommendations for Funding for 100 PhDs annually
Nayudamma Committee	For the Postgraduate Education in Engineering & Technology	1979-80	Committee recommended of PG minimum qualifications for industry , R&D etc.
Nayudamma Committee	IIT Review	1986	Committee recommended of Greater flexibility in Academic programme, Focus on engineering research , Faculty mobility
P. Rama Rao Committee	Reshaping Postgraduate Education in Engineering & Technology	1995	Committee focus on 21 Months M. Tech, Increased scholarship amount, Assured employment for M.Techs, National Doctoral Programme.
R.A. Mashelkar Committee	Title of the committee report is Strategic Road Map for Academic Excellence of Future RECs	1998	Important recommendation of committee is Conversion of RECs into NITs with the status of a Deemed to be University and structural changes in governance
U.R. Rao Committee	Revitalizing the Technical Education is the title of	2003	Following points are recommended from committee , Regional inequity to be removed

	Committee Report.		Faculty shortage to be addressed, Need for planning and coordination in the working of AICTE
P.R. Rao Committee	Review of IIT (Indian Institutes of Technology)	2004	Most importuned recommendation from the committee is the Increase UG output of IITs, Fund infrastructure increase, Add new IITs but maintain quality.

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