



Human Resource Development in Technical Education by adopting Curriculum changes.

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ABSTRACT: *There has been discussion and debates in our Country about Change of Curriculum in Education Sector, Our Education sector Secondary and Higher Education has been changing its scope and direction from many years. In higher Education development of Human Resources is most crucial for success of Economy & Human Development. Our Human Resources in Technical Education has been encountered many problems such as different and not appropriate to present Technology area of competition. The eminent education elite has recommend through various commissions about need of changes in our Education particularly in Technical Education System. There are in-visible hurdles, barricades for their execution. This paper will try to bring us insight about various commissions been appointed by Indian Government about changes requisition in our education System. At last review on how far we achieved it. This paper explains it as Government has responsibility to act and allow Educational reforms in this Fast changing Global Environment.*

Keywords: *Human Resource Development, Education, Technology, Reforms.*

1. Introduction

Human Resource Development depends on various factors such as Skill, Knowledge and contribution towards work or Profession. Human Resource Development has its importance and root stems from available education opportunities. Apart from this importance of curriculum cannot be ignored. Developing nations stood at one notion that their system of education curriculum is relevant as per their requirement, the other side of the coin is, if there are open economies such as Globalization dependency for Technology and Development will increase even though we have capability to understand. There are few cases that Developed countries in Asia also suggested Developing countries as India to concentrate on change in Curriculum to face the Challenges of their own Problems and contribute for development. Interestingly there is no

shortage of intellectuals in India and several commissions has been also appointed for this work, despite there is gloom over reforms in Technical Education in India, the slow pace at last created our position by occupying only one place in world Top-ranked Engineering Institutions.

Our systems of experts are good and our Educational observation and inspections bodies are excellent, but why there is lackadaisical observation about changes taking place in developed countries Education Curriculum. Human Resource Development has strong foundation on the Curriculum. The other importance observation is we have talented students but we don't have innovation capacity. It is been universal fact that many students disappointed about environment and inclusion of new Syllabus in our Curriculum. Migration to Germany,



U.S.A, Australia, New eland etc. is one of the reasons. Curriculum adaptability time taking is other factor as the initial stage has been not covered by us. There

2. Review of Literature

Various Commissions, Committees and Educational Policies in India recommend for need to Develop Human Resources in Education Sector.

Government of India has appointed various commissions and committees to enquire the problems and bottlenecks of the country and higher education quality and suggest suitable remedial measures for recovery from starch. All these reports emphasized all the problems as noted by earlier Committees. Problems are in recurring in all the reports of the committees or commission. Below described are some of the facts by all committees, which are relevant to our present discussion.

2.1 The *University Education Commission (1948-49)* this committee under the leadership of Radhakrishnan submitted report on November 4, 1948, presented on University Education, it was appointed by Government of India. It has objective to suggest suitable suggestions to help and bring for education development in India for present and future. This committee has presented that problems has become in new shape. We have now a wider conception of duties and responsibilities of universities. They have to provide leadership and commerce. They have to meet the increasing demand for every type of higher education- literacy, scientific, technical and professional. They must enable country to attain in as short a time as possible, freedom from want of disease and ignorance by the application and development of scientific

is need for Transpercey and System has to take accountability for framing Curriculum and syllabus as per changing Trends, without compromising on values.

and technical knowledge. It is for the universities to create knowledge and train minds that would bring together the two-material resources and human energies. In full and final the commission aims at the inevitable aspect of 'Human Resource Development.

2.2 Committee on Model Act for Universities (1961) D.S.Kothari is the Chairman of the Committee and submitted report to Government in 1962, it was appointed to look into matter of and evaluation of structure of Universities organization and recommend for necessary solutions in Education. D.S.Kothari is the prime head for the committee. It was also instructed to prepare a model act for Universities , recommendations of the committee were submitted to government in 1962 which includes which are relevant for the present study recommended for have design of curriculum

2.3 The Education Commission (1964-66) Head by Kothari in July 14, 1964 to advice on National Development of Education and dictate general Principles and Policies for holistic development of education in all stages of Education. It was appointed by Special Resolution. It constitutes 17 member commissions, submitted report on June 29, 1966, headed by D.S.Khotari, who is also chairman of U.G.C and Sri, J.P.Naik from abroad, was appointed as Secretary. It has recommended the following.

1. Transformation of Educational System to fulfil needs and requirements of Nation.



2. It is necessary to have very good standards at least in few sectors comparable, to achieve this we need Qualitative Improvement in Technical Education.
3. Development of Education facilities to augment Work force through provision for equal education opportunities.

Commission stated that Higher Education is in drastic state. Standards are just average and they are visible, need constant examination. Curriculum content is not sufficient as per present and future requirements. All systems are working in their own way they know what they are doing.

2.4 The National Policy on Education (NPE) (1968) NPE has earmarked History in higher education after Post-Independence. Objective is to promote National Progress. Emphasized for radical improvement in Technical Education. It has given comprehensive plan for Human Resource Development. All sectors growth highly depended on availability of Technical education in both quantitatively and qualitatively. Special note is providing high skills order in Technical.

2.5 The committee on Governance of Universities (1971) this committee has presented report on Governance and Quality administration in India. It submitted report to UGC in 1971. Its main focal point is to discuss about structure and functions of universities. It has mandated to Universities to have role in development of Higher Education and important of Academic Council

3.7 Engineering Education Scenario.

Global Scenario

Engineering education throughout the world is facing major challenges, as the pace of technology change shows no signs of slowing down. Though the rate of increase in technological developments has provided an impetus change to engineering education, the social and political factors are increasingly becoming important. Since the society requires more quality Engineers, Engineering Education is to be more responsive to these changes.

Blumenthal (2003) talked about system application, suggested that we can take any excellent system and replace with existing system, since they are vast differences between people and their educational background. In his observation he said developing countries frequently modeled their existing education system will not bring at least good results, Developing countries takes high time to replace education infrastructure such as Lab, High-Technology interaction system to provide good learning environment. Even in developed countries with a strong manufacturing base, it is difficult to provide the resources required, and there is an increasing emphasis on generating income and from industry.

Duggan (1992) in his research explained about the Engineering Education how it goes in North and Europe of the World. In Europe it goes on Theoretical and award of Bachelor and Master Degree and other part it continues as practical work. **Way kuo (2006)** pointed out that United States aims at engineering education in creation of Science and Technology to the purpose of life. It is also called as practical and applied sciences in the daily life of people. In Germany the Engineering Education concentrates more on matters of



teaching, research and learning towards technology, academic self organization. Australia is focusing on interface with Technology learning.

Caludio da et al (2002)⁹ in his research pointed out that South America, the nature of engineering depends on Social, Political, and Economical Factors. The Strong knowledge is to chase Social problems. African countries have been facing with de-motivated staff and poor Lab infrastructure. Traditional approach is not working well, it is also warning for Developing countries in the world to concentrate in the best of the techniques for developing Technical Education in the their system. This is a clear indication that resources in engineering need itself else self development is not possible by country towards attainment of goals.

UNESCO;Raja Roy singh (1991) pointed out that Engineering Education in the world has been recognizing the importance of engineering education with aspect of Research and Integral entity and inseparable activity. Engineering Education is the index for Industrial employment for any country and Engineering Education Qualitative index is itself reflexive to determine the potential of the country in fixing its capacity for building good Human Capital Research plays important role in engineering education .Industrial requirement is considered as most important one. Preparing Human resources in this dimension is the most preferred one by any country, since development needs extension for better future.

Lawrence (1980) had given information that The irrational alliances among Engineering Education, Economy, Social Mix of these elements and globalization

of Markets and explosion of information in the last decade driving engineering education and sometimes it has given irrational alliances in the education causing imbalance in engineering education. Globalization of World has created to have best effect unless all come close each other and bring positive effect in the education system. To maintain the closeness and alignment of technology in and from the developed to developing countries we need to understand that with development of one nation's technology how one country can be member of developed nations.

3.8 Indian Scenario of Engineering Education

The origin of engineering education in India evolved from the British period, although educational systems have been in place of centuries. The idea of creating technical training centers came out of the necessity for training the overseers for the construction and maintenance of public buildings, roads, canals and ports of aiming for British importance. The emphasis up to 1960 was towards irrigation, establishment of infrastructure like power lines, rail network and road, (www.engc.org.uk).

ENDREC (1970) estimated that Consumer goods demand and need to establish communication infrastructure from the year 1960 to 1990 also has insisted for need to have more engineering institutions to meet the completion by Government of India. Public Sector establishments has become necessary to develop employment to Indian citizens, but it has also created need to develop engineering education to get the requirement of human resources. There is tremendous increase in the need of well qualified manpower during this



period with quality of skills and inputs from engineering graduates. This has showed much stress for qualified and quality manpower from Electrical, Electronic, and Mechanical. The nexus between Human Resource Development and Country development in Economical, Technological has been increasing every decade and now from every year to year, day to day. This has necessitated inviting Private Sector participation in Engineering Education to augment the increasing demand of Engineering Graduates.

3.9 Present Scenario of Engineering Education.

Change occurs in the every corners of life, any country has only one chance just adapting to it, neither it can skip or defer it. Technology changes in the same pace and countries human resources should also change as per this requirement. Internet has occupied space in the life of man, Technology, Country. The LPG changed the World as a village with unbelievable interaction and thus showed impact on organizations and companies; since companies go where they get best investment opportunities and perfect Human capital. Developing countries themselves has competition with inter and intra, pushing for increase in Human Resource Development.

Engineers no longer within the framework of their specialization in their own field, they have to gain knowledge of other fields also. There is always a need to sustain in places crossing geographical borders and invent technologies as per changing needs of countries and practices,

The information technology revolution has given potential for Knowledge revolution and given valuable inputs to

engineering education to peak quality levels than past, though it has faced slow-down , but showed good aspirations about future. Technical education should work to create intense interest among them to explore sciences, technology, and invention of new things. Engineering students should have the capacity to think new techniques of production or technology, as this is possible only by applying the knowledge they have gained during their studies in colleges. It demands changes in curriculum at the right time; so that it can help organization they want to work they have been working

Most governments look to educational institutions to provide human resource with right skill and knowledge. It is the responsibility of higher educational system to enable a smooth transition to knowledge economy advanced level of technology. Each country must ensure that they are ready to empower their workforce who will fill the requirement of the industry and thus stand on their country has an edge over the others. Therefore, ensuring the young workforce has the necessary skill and competency to succeed in their job now become the major responsibility of the educational institutions.

UNESCO's data and other Statistics reveal very interested information that that enrolment data has showed much information about engineering graduation in recent decades, the lost of employment due to economic crisis is not only because of, the generation should also see how good they acquire their skills to meet the demand and globalization has also created opportunities as well as threats, instead of relying on one platform, students should also concentrate on other platforms also.



There is an increase of 152 million in tertiary education. ILO's global report also indicated youth should try to get more skills acquainted with real knowledge and bring ability to meet present and future jobs requirement. The 'new skills set' means Global Professional engineers.

UNESCO (2010) insisted that Quality of engineering education and Washington Accord and Bologna process has specified criteria for accreditation and assurance of quality in engineering education and quality assurance. Countries such as UK, USA, UK, Australia and South Africa, Japan, Malaysia, Germany, Singapore, have approved Washington Accord. The engineering degrees enable students in pursuing additional degrees in these countries. We can understand from this how it is best to have developed version of education. Internationalization of engineering education is still a big process since many countries have not adopted. Indian Engineering Education has to still to go except from reputed IIT and NITs, we need innovation and Technology Development capabilities. This is still a un-chased dream of Indian Education System.

UNESCO (2010) observed that Technology Knowledge is Technical graduates; Global Market is competition among haves and have-nots. Have-nots has such a competition and incapability to buy technology from developed countries and Developed countries are highly interested technology transfer but the capacity building is weak to absorb technology available, neither no capacity to buy or nor Technology knowledge is available to create or disseminate existing technology. Innovation is a big success, how much good we are in promoting or budding innovations in our country or

does our education system has capacity or not. One has to question this for themselves, Initiative of National Academy Engineering, a report entitled "The Engineer of 2020: "Vision of Engineering In New Country (2005)"¹⁵ analyzed how engineering education has to be engineering as per changing demands and circumstance by 2020. One has to question how far we have achieved this from every year or phase wise. Engineering Students should get very developed, enhanced engineering education and rich quality experience. One has to fix desired outcome and measure the outcome achievement as pre planned in time bound.

American Board of Technical Education has notified that there is innovation in engineering education and National Science Foundation (NSF) and Engineering Education Coalitions has tried to bring changes in engineering education. ABET also regarded the traditional engineering education concepts and theories should also be gained momentum along with modern educational background. Interest of all Stakeholders should be visible in all spheres of Engineering Education. Reflecting mission is the criteria of the ABET for Engineering Education in the defined programmes by Engineering Colleges.

3.10 Engineering Education and Globalization

Higher education sector in India has been facing challenge because of Globalization, technology has been changing and required skill set is also changing, the rate of change is very fast and dynamic in nature. They have to work in teams and find solutions for technologies and solutions for present technologies. They



have to confront solutions for present as well as for future. This capability will come only if they have good education in this regard.

Universities should not only concentrate only PhD, they are good in nature of discovery of science and truth of the facts, but the practical, Industrial and technological world demands they should produce Industry ready or invention or innovation capability. The 'Knowledge era' demands adaptability and global profession needs these skills.

3. Developed Nations and Their Skill – based Curriculum

We have to understand that ingredients in our Curriculum could not be useful, unless we put them in practice, skill level to curriculum will develop Human Resources better than Curriculum to Skill Search, below we have presented few countries and their importance to engineering or Technical Education Curriculum and out-put base education system.

3.1 United States on Employability Skills of Graduate Engineers Secretary's Commission on acquisition of Necessary skills (Scans) report found out that, to degree extent colleges and Universities failing in their role to produce skills for engineering graduates, the report envisaged that Higher education system should be a reflecting mirror for needs and aims of Industry. Unemployment can be solved by observation of both in one objective. Accreditation Commission (EAC): Technology Accreditation Commission (TAC) and computing Accreditation Commission (CAC). All the commissions are part and Parcel of ABET's Publications in 2004. A specific Criterion has been setup with

recommendations about attributes that engineering graduates attain.

- a) Ability of applying knowledge from Maths, Science, Engineering.
- b) Analyse, Design and Interpret Data abilities and conducting experiments.
- c) Designing a Component or System or Process to meet desired needs.

3.2 United Kingdom

According to Engineering Professor's Council (EPC), United Kingdom, and the key skills for engineering:

- a) Transform existing systems into conceptual models
- b) Transform conceptual model into determinable model
- c) Develop models determining specifications for systems.
- d) Create Models by optimum specifications, through careful observation
- e) Creating Great systems by target method, by applying results from physical models.
- f) Critically review real target systems and persona performance.

3.3 Singapore

IES (The institution of Engineers, Singapore) released in 2004, released required competencies for accreditation criteria of engineering programs.

- a) Achieving Desired results by System Design and components or process, synthesize solutions to achieve desired outcomes or results.

There are other skills also presented, but most important one has



taken as per our research work. One has to determine, the competence level of graduates to perform skills required for employment and relevance of the graduates. There are 18 competencies in which graduates need to be proficient in order to succeed in the workplace. The authors initially assumed that technical skills were most lacking and focused their intent on defining the ways to promote and advance graduates' technical skills and abilities.

3.4 United Kingdom Standards for Professional Engineering Competence (UK-SPEC) has prescribed that an Incorporated Engineer must be able to:

- a. Combination of general and specialist knowledge in engineering and apply for existing and Emerging technologies.
- b. Provision to apply appropriate theoretical and practical methods to design, develop,
Manufacture, construct, commission, operate and maintain engineering process, systems, and services.

3.5 UK-SPEC further refines the first two competencies for Chartered Engineers

- a. Application of general & specialist engineering knowledge and trying to optimize its application on existing and emerging technologies.
- b. Analyse solutions for engineering problems by applying theoretical and Practical methods Engineers Play critical role in IT, Infrastructure and power sector, and there is problem of skills un-met the demand. There is need to face challenges in difficult situations.

The aim of above insights brought for our consideration to evaluate about our changes in Curriculum in Technical Education really develops Human Resources or not. Human Resource Development is a branch of science that envisages about how we have to change or mould our elements of Education and try to be at race in Globalization. Change of Curriculum is a perennial activity includes all stake-holders. Universities and governing bodies role is vital and there is significant to bring changes as per changes in context of knowledge and practical exposure. As discussed earlier different countries has been reflecting necessary competencies or skills mandatory for development of professional education. This has showed improvement in their education and quality towards objective. We can measure through existing syllabus chances provided for experimentation and exposure available towards Technology. Though NBA or NAAC Provide Autonomous status and through Inspection of AICTE in India, the reason behind quality in Engineering student Knowledge level of know-how is not improved apart from marks or desired knowledge level or skill level.

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