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Human Resource Development in Technical Education with Technology Education

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Abstract: There are constant efforts by Government agencies and stakeholders to develop Engineering Education, there are different perceptions, as Developed Nations moving ahead in Technology in very less time compared to past, Developing Countries still fail to achieve the desired level. There are plans and systems but right mechanism is absent, though we have very bright talent, missing ingredients and atmosphere created a hurdle for developing countries to reach the Innovation and Technology Development. Technology can be taught as Education, Technology Education is not new Phenomena but it has importance if our Engineering Education System recognizes and Stakeholders play crucial role in that. Technology Education and Engineering Education though closely connected but they have high relation and difference, difference is to know how one changes other, understanding these changes to further increase of knowledge for better Practical and Experiential Learning. This Paper tires to convey importance and few ways to develop Technology Education in Colleges for development of Engineering Graduates.

Keywords: Technology, Engineering Education, Innovation, Education System.

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I. HUMAN RESOURCE DEVELOPMENT

Human resource management is the subject of widest and extended scope in its nature. It has reached all the areas of all fields where Human is a factor and as a science and Art, it has depicted many times that Human Factor could be molded and put for efficient use of the resources, Human Resources has two dimensions, in Organizational Point of view and the second is the Human Resources at country point of view. Organizational Point of view it has showed sufficient and extraordinary impact from Management and Training, Performance Management etc., there is need to show that Human Resource Management has scope, Macro level and Particularly at Education sector.

Matthew's (2004) argued that unless integration of human resources has taken place it is impossible to face challenges of human resources. This argument created further development of Human Resources. The competition countries can buy same or better machines or materials, but the difference between the high performing countries and the one performing low lies in its people. An organization can rise only up to the level its people can take it to. HRD also associates the growth of the organization with the development of employees. A country can rise only when it has perfect resources in qualitative and quantitative.

HRD has word 'human', it is resource and explanting their behaviour at the job and in the organizational scope. In the words of **Megginson (1982)** explained that HRD at Nation's point of view is creation of knowledge, skills, creative abilities, talents and attitudes of the available population. In the dimension of Individual enterprise they are qualities and abilities, acquired knowledge and skills such as talent and aptitudes of employees. Development defined as acquisition of capabilities required to perform present job or future job. By applying this to country context we can say that we need to develop people or Human Resources in country so that their abilities will bring either to work for Industry or for country development aiming in technology perspective.

Human Resources development aims at developing people not only at firm level but also for country level, which will facilitate to bring fruits of economy development from the foundation of technology and technical education with strong foundation. Transformation of knowledge, From College to workplace as discussed by **Lynton and Pareek (2000)** Knowledge Transformation takes place as the way training is setup. Technical Education has two dimensions those are Knowledge and Competence these will sure has to come from educational Institutions. This will ensure to handle Technical education job positions. Knowledge gathering contains training of existing human resources either in Industry and from Industry to Industry or as per this thesis mainly from "Engineering Education to Industry". The effectiveness in a task and enhancement of the performance of the participant relates to competencies related to Organization or Industry. They also stressed

one has to maintain the vital process that is assessment of technical education; assessment is the value addressing the performance parameter and competence of the technical education.

Harasim, (1995); Vleuten, (1996); Joy-Mathews et al (2004); Buckley and Caple, 2004) opined that assessment of technical education programme, includes teaching and learning, the curricula, resources strategy and policies being adopted and the relationship between Industry and education sector. There are many models in developing Engineering students but they should reflect how much knowledge they possess and competencies they have after completion of their graduation. Industrial and Service sector should also give their reflection on how a student has been performing after completion of their graduation i.e. during their Project time or after they have been absorbed in Full-time job position.

II. LITERATURE REVIEW

2.1 *Technology Education significance for Intellectual Development*

Technology education is wider concept it covers all the required aspects for skill, innovation, required competencies, it has holistic approach. Extensive literature survey is available only through some secondary resources. This is the reason many dimensions has taken to explain importance of Technology Education

Solow (1956) said they are two models being used by economist in past for economic growth, the neoclassical theory which was pioneered by him stressed about physical strength. In 1980 a new economic growth theory emerged.

Lucas (1988), Romer (1990) and Aghion & Howitt (1990) theory was developed in response to criticisms of the neoclassical theory, in this theory there is detailed explanation. Human Capital and innovation, research and development are the main elements for economic development. The theory has implications such as skill, knowledge, technological change are the factors promoted for economic growth.

The organization for Economic Co-operation and Development's (OECD) report, Technology, Productivity and Job Creation (1996), described that knowledge in technological area in optimising a nation's performance in the following areas, Technology knowledge is the prime factor in advancing a country economic development and quality of life of people also changes with phase of technology. It was observed that Nations who are the best performers in Technology are now the assets of Technology source for developing world. **Margison (1999)** stated Knowledge underlies in the investment called strategic investment has more value than investment in physical investment

In this regard, **Ashton and Green (1996); Raggat and Williams (1999)** observed that this created a situation need for competent generation for the present Industries and changing demands of Industries also impose for good quality of human resources. These resources have to be prepared from the education system of country. **Musmari (2002)** further highlighted the Society development and expansion of the progress is highly depended on quality and quantity of natural capital and Human resource capital. There is need to develop resources in this dimension. Engineers and Technicians are essential for Industry development.**Bennet and Lockyer (2004)** hinted that from Last few decades there has been changes in Technical Education with as introduction of new Technology i.e, Information Technology, new student approach has taken importance to enhance his skill and knowledge for necessary spheres. **Rafik (2009)** has strongly pointed that changes in the education system is, there is increasing pressure to have a strong bond between Higher Education and Job Market to increase the intensity of Employability trait in the Curriculum.

Rafik (2009); Rafik et al.(2008) emphasized that Developing Countries has to concentrate on Technology and Vocational Education to have at least par with Developed Countries . **In the World Bank report, Global Economic report 2008**: **Technology Diffusion in the Developing World (2008),** it has analysed that very good tools are available in technology in improving production and services. National Income has to be increased by following good techniques of technology education. **Sharp & Pavit (1993)** said that Trial and error are the methods used by humans to know things how they work and results, it is also called as research and development in creating specific devices and for Specific Technologies and solutions for the life and Society. **World Bank in Higher Education in Developing Countries: Peril and Promise (2000),** stressed that the crucial factor for sustaining development is the higher education. Human capital delivered by Universities should have the capacity of absorbing and adapting fast to new technologies in the present and for coming future

2.2 HRD and Manpower Development

European Union has become a Hub for Global Workforce, they have cultivated Knowledge Based economy and it has given way to have excellent workforce to meet the Technology and employability of the European Union. **McLean and McLean (2001)** defined HRD as cleared that HRD is potential instrument that can bring marvelous effect not only in organizational level but also at community, nation, and for entire humanity.

Jackon (2009) suggests that Industry and Government Worldwide would welcome effective ways to bridge graduate skills gaps.

Mian Salimuddin (2004) suggested that Developing countries should concentrate on Innovation and Technology as they are also emerging from every part of the world. Educational institutions, lack of good business models to prepare good Technology Executives. **Jean (2004)** explained that in dealing with any kind of technical tools and production there is need to develop Human Resource from Technology and Production and the basic education is necessary in all the aspects of Technical education and Vocational Education. **EtzKowitZ (2003)** did study of United States research Universities, and claimed that Universities should become centre for Innovations. Universities at least should generate Patents for development of ownership; today world has been running on Patents generation. **Zuscovitch (1986),** texted that the Ministry of Science and Technology and Innovation, Malaysia (MOSTI) defines innovation as: Distinct institutions that work for jointly and individually towards contributing to the development and disseminating New Technologies and polices by the Government to influence the motivation innovation process and development of people and country**Suriah (2007)** revealed Education should work towards for interconnected institutions to create, store transfer the knowledge and skills which create new technologies and understand old technologies. **Dobbs, Sun & Roberts, (2008)** expressed that the theory of human capital is derivation from the common assumption that in the competitive market competition and knowledge is available for each and every human being. **Livingstone (1997)** stressed that there is need to give Human Resources as equal importance to resources for production.

Yong and Jong (1919) studied the relationship between human capital and Technology, they found Technology will progress if there is investment in Human Capital and ensuring that investment in Human Capital will yield quality Human Resources and according to them quality means an Individual who posses Knowledge and the Capacity to adopt New Technology. **Sanjaya Lall (1999, 2001)** reiterated that countries competitiveness is determined by the skill factor embedded in human capital, the effectiveness of technology is determined by the usage and Technological skills of the Students. He also stressed about need for training people in divergent skills, since technologies are also divergent and varied in nature. He also hinted that if skills are there then we can absorb, export, import and develop technologies. Research by **Mohnen and Roller (2005)** found that Innovation in any country will be developed only by skilled Human Capital and it is significant for Industry and Country has whole.

Varsakelis (2006) in his article highlighted that Innovation and Quality in education has correlation. This can be known by amount invested in Higher Education and Innovation activities undertaken by Colleges, Varsakelis identified this by observing Data of 29 countries which developed their interest in innovation by establishing exclusive education policies by investing in Higher Education and leading towards innovation path. **Bell; Felder and Brent (2000)** examined that many universities changed their programs to incorporate objectives in graduate programs to fulfil the objectives of Industry requirement also. **Radcliffe (2005), Patil,(2005)** opined that there is mismatch between skill set of engineering graduates and those needed in Workplace Graduates. Australia council of Business also stated that there is fall of quality from batch to batch and ability of doing jobs also came down heavily

III. Technology Education As Learning Factor To Develop Hr In Technical Education

These are some of the areas; we recommend using Technology Education as an instrument to develop Human Resources from School administration to College administration. It has been recommended to use this at all the levels of education, these are not final but assumed to initial steps, and it may further give development for any new systems or models.

Dimension 1: Fortification of Engineering Education: Education system in Engineering Education has to prepare changes in present education system to increase the capacity of innovation and creative process. There is vast difference between Engineering and Technology this difference can be discovered only when Technology interaction will increase with more realistic Practical works in Academic Institutions. Labs have to play crucial role to increase interaction of Technology in Labs.

Dimension 2: Technology Education Significance in Engineering Education: We need an objective base engineering education such as norms that a college should bring Patents at least as desired by the Country or state. This is only possible when Technology Education has been given importance with different parameters as Technology incubation centers and Innovation centers as mentioned earlier not limited to Colleges. Technology Education Significance can be increased with increase of Simulation labs. Unless Technology education has not interface in the Engineering Education we cannot further bring. In reality there is vast difference about importance given to Technology Education in developing Countries Engineering Education, but they push for Performance.

Dimension 3: Driving towards Benefits of Technology Education

Technology Education brings results such as less time for innovation, Decreased time for Training Engineering graduates for their professional life, Industry Ready engineering Graduates, Skill development during their Academic life. Benefits can be leveraged as long as there is interface between Technology and Engineering Education. Since innovation or Patents need Knowledge of process and Application of knowledge for developing or Changing Process.

Dimension 4: Technology Education Integration in Engineering Education

Engineering Education Syllabus should have a good integration with Technology Education, this integration will bring Quality of Human Resources and reduces skill gap since Theory and practice of Technology Education will be done. Integration gives importance if this is made optional it may be difficult to increase concentration on Technology Education. Technology Integration has to bring changes occurring time to time, this is has be done by voluntary interest in from available sources and there should be much exploration about unknown sources, this is the reason why developed countries has high edge on Technology. Even their advancement continues as their explore more and more through experiential learning.

Dimension 5: Fostering Technology Education in Colleges

Technology Education could be fostered as Technology Education specific workshops, Conferences and Technology Exhibitions; It has been observed they occur very less in developing countries since importance has been given to Academia rather than experiential learning. Innovation may be even failure but the climate should be continued and available in Colleges so that Student can increase his motivation and do research in his areas. Technology Analysis and Technology Development required areas can be given as Mini-Projects not on paper but both as in Germany as one should show both on Paper and implementation of Execution.

Conclusion: The Dimensions are not ultimate, they can be more Dimensions also, aim of this paper is to bring the lime light about need to develop Human Resources in Technical Education i.e in Engineering Education, and further studies can give us more insight. Stakeholders in Technical Education should concentrate on aspects gives them at least stand in pace of Technology.

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