Preparing Well Groomed Human Resource for the Engineering Institution …. An Experiment

Hemant Abhyankar[1], Siddharth Jabade[2], Deepak Tilak[3]

[1]Director, Vishwakarma Institute of Technology, Pune INDIA
[2]Department of Mechanical Engineering, Vishwakarma Institute of Technology, Pune INDIA,
[3]Vice Chancellor, Tilak Maharashtra University, Pune INDIA

hkabhyankar12@rediffmail.com[1], siddharth.jabade@gmail.com [2]

Abstract

Engineering educational Institutions are wellsprings of knowledge. They play a central role in the development of human resources and in turn socio-economic development. India has witnessed an astounding growth in diverse sector of industry in the last two decades. This has resulted in unprecedented demand for engineering students. In view of this, India has taken steps to open private engineering institutions that are run by charitable trusts on no profit basis. These institutions are not owned by the Government. Today, more than 90% institutions in India are private non-Government institutions. The engineering student intake in India has scaled up from few thousand to around 500,000 over last two decades and is increasing continuously. The challenge is to maintain quality of education imparted by private institutions in this competition. To this effect it is imperative to first attract human resource in terms of faculty, administrative, supporting staff and further groom the existing human resource by providing enabling environment in the institutions.

The objective of the present model is to prepare open, inspired and enriched minds of the faculty, administrative, supporting staff combination of them that forms epicentre of the engineering institution and would ultimately contribute to the enhancement of the quality of education imparted to students. This model was conceived six years back and is being implemented over the period of time. This paper presents the learning of the development and implementation of this unique model in Vishwakarma Institute of Technology, Pune (VI, Pune). The deliverable of this model is the diverse aspects, schemes that can be implemented in a private/ self financed engineering institute to develop ever greening well groomed human resource that contributes to the quality of education.

Key words: Engineering institution, well groomed

Backdrop

Central to the process of education is the development of discerning, thinking, learning, creative minds and intellect that are able to perceive, observe, think, strategise and act in consonance in a creative mode. Cognitive development and the accumulation of particular values, attitudes and skills are important objectives of education systems.

Education is a function of five dimensions of quality that include learners, enabling environment in the institute, content in terms of curriculum, processes of learning and outcomes of the learning. The outcome includes acquiring literacy, numeracy and life skills, creative and emotional skills, values and social benefits. Complementary components associated with these quality dimensions are of educational system / institute such as human resources, educational infrastructure and educational processes [1].

Thus these components need to integrate in the educational institute so as to impart students the quality education that constitutes aspects of learning to know wherein the students and faculty build their own knowledge as a continual learning process, learning to live together to acquire critical skills so as to develop individuals free from discriminations, learning to do that focuses on practical applications of what is learned and learning to be that emphasizes the skills needed for individuals to develop their full potential (Understanding Education Quality: EFA Global monitor-

ing report, 2005)

Generally, the outcomes of education is most easily expressed in terms of academic achievement sometimes as test grades, but more usually and popularly in terms of examination performance. It is also equally important to impart facets of intellectual, social, spiritual and physical personality development with a aim of imparting knowledge, skills and developing character and values in students. Implementation of these qualities in terms learning process and providing academic environment in educational institute is carried out by the human resource that constitute faculty, support staff and administrative staff. The important aspect is to prepare the said human resource to impart these quality aspects apart from merely teaching so as to make them a well groomed human resource that would enhance quality of technical education. The model presented in this paper addresses this aspect with a frame of reference to private engineering institutes in India.

There are varying approaches reported in literature by the authors Mari Murtonen.[Murtonen et al 2008], Diane G. Gal (Gal et al, 2005), Carol R. Rinke (Rinke et al, 2008), Päivi Tynjälä (Tynjälä et al, 2008) have provided perspectives on motivation, teacher's career and learning aspects. Kaplan K, and Kaplan J (Kaplan, 2003) and Soetendrop R, McLaughlan R, Roach J, and Childs B (Soetendrop et al, 2005) have proposed and designed IP courses for non-lawyers as a formal part of their technical education and implemented them through interdepartmental collaborative efforts.

Genesis

India has witnessed an astounding growth in diverse sector of industry in the last two decades. This has resulted in unprecedented demand for engineering students. In view of this, India has taken steps to open self financed engineering institutions, popularly known as private institutions that are run by charitable trusts on no profit basis. These institutions are not owned by the Government. Today, more than 90% institutions in India are private / self financed non-Government funded institutions. These were established in 1983 onwards. The engineering student intake in India has scaled up from few thousand to around 500,000 over last two decades and is increasing continuously. The genesis for developing the present model spurred because of the passion of creating niche area and provides students inputs in terms of enhance quality beyond what is offered in conventional engineering institutes around.

It is imperative to integrate faculty to imbibe dimensions of quality such as enabling environment in the institute, content in terms of curriculum, processes of learning and outcomes of the learning in terms of learning to do, learning to be, learning to live with each other and learning to know by creating student centric intersection of academic environment / teaching process and human resource so as to impart the said quality aspects beyond conventional teaching that is targeted to complete the syllabus.

Thus the challenge is in such a crowded place of institution how to attract good human resource, groom them so as to prepare open, inspired and enriched minds that are fertile to accept the above mentioned concepts of enhancing quality of students through innovative ideas / schemes, take initiative and implement the same to the effect of enhancing quality of education and yet retain this well groomed human resource in the institute. The approach of achieving this is presented in this paper.

The Approach

To put the subject in perspective, it is important to appreciate academic structure of engineering education in India. Primarily, engineering institutions include IITs, Regional Colleges funded by Government and self financed institutions that are affiliated to Universities in the region. The self financed institutions are relatively young in the sense most of them were established in early 80's. VI, Pune was established in 1983. Though the self financed institutions have financial autonomy, they do not have academic autonomy meaning curriculum is developed in the University by a central body that is constituted by representation from various affiliated engineering institutions. Further, examination conduct and evaluation is carried out by the corresponding University. If any self financed institution is

desirous of academic autonomy, they need to apply to the University Grants Commission of Government of India for grant of academic autonomy.

As a first step, to create enabling environment it was necessary to opt for academic autonomy because in the affiliated University structure flexibility for curriculum development by a single institution is limited. Thus to experiment with the curriculum and academic structure, it was necessary to opt for academic autonomy. Thus the management and senior faculty of VI, Pune were first exposed to the rationale, concept and benefits of the new curricula and academic structure. It was agreed with consensus of all to go for academic autonomy that would facilitate new curriculum development. The policy decision was taken by the management to opt for academic autonomy. The policy was conveyed and percolated to the entire cross section of the institute through various tiers from professors to administrative staff through series of interactions. Thus VI, Pune applied for an academic autonomous status and recently conferred with the same.

Secondly, the focus was to create content of curriculum and academic structure. The objective was to develop a curriculum with integration of faculty to foster student development in intellectual, physical, social and spiritual aspects without compromising on the technical inputs. A relevant and need based yet stress and burden free curriculum and supporting academic structure was developed. This is elaborated in the paper presented by the authors in ICEE 2008 held at Pecs, Hungary [Jabade, 2008].

Quality objective for the institute was conceived and arrived at by the consensus of faculty, supporting and administrative staff. Further, faculty was involved to set in objectives of curriculum so as to impart the above mentioned aspects of quality in students. In this process the faculty got thoroughly involved and was indirectly drawn in to process of brainstorming and learning. This ensured that the faculty also is a part of learners in the process of learning.

Entire cross section of faculty was involved in the process of curriculum and academic structure development. This helped in integrating faculty in the learning process and seeding sense of ownership along with responsibility about imparting the curriculum in them. The stakeholders including industry, students and faculty were integrated in the development of the curriculum. A board of studies was formed wherein there is a representation from industry, academia and institutions of higher learning such as IITs. The inputs related to the need of the industry were assimilated through various meetings with various industry personnel. Further, brainstorming sessions were conducted with faculty with an aim of figuring out the way to address the industry need in terms of inputs to be provided to student in the curriculum. The intense interaction of the faculty members with industry personnel and IIT Professors helped them get much needed exposure about pragmatic and practical curriculum development.

On the other front faculty were encouraged to pursue their post graduation / doctorate in institutes of higher learning such as IITs. Interested faculty was seconded on full time basis in these institutions with salary protection. This helped faculty pursue their academic endeavors and getting exposure of research institutions of higher learning. One of the authors of this paper (Dr. Siddharth Jabade) was deputed to IIT Bombay for pursuing PhD under such scheme. Similar scheme was also implemented for the support staff to upgrade their skills. Sufficient number of faculty was employed to maintain recommended faculty to student ratio of 1:10. This provided flexibility to depute faculty for higher studies without burdening and hampering teaching load of other faculty members.

To encourage research attitude, monitory benefits were announced for the publications in refereed journals and national / international conferences. Apart from monitory benefit, appreciation of the publications in terms of recognition at the time of annual social event of the institute motivated faculty towards research and publications.

Intellectual Property Rights Facilitation Centre was established to facilitate patent filing of the inventions of faculty and students. The policy was laid down on sharing of the net revenue upon commercialization of the patent wherein major share of the order of 60 to 70% is allocated to the inventors. Further, institute bears all the costs of patenting and provides support for patent drafting and filing. This has provided faculty an opportunity to commercially exploit

their inventions with minimum risk and opportunity to earn through commercialization of their invention. Model IPRinternaliseTM (Jabade et al, 2008) implemented in the institute to integrate intellectual property rights in technical education is widely appreciated (Jabade et al, 2007).

Open, transparent and cogent policies for consultancy were laid down wherein principal investigator could get of the order of 60 to 70% of the revenue generated. This has helped faculty and support staff engage in consultancy. In one of the forms of consultancy, the faculty has developed tailored dedicated courses / modules according to the need of the industry to offer it to the employee of the industry. The modules were developed for reputed industries such as TATA, L&T, PRAJ etc.

To further provide financial benefit to faculty, supporting and administrative staff, incentive scheme was implemented apart from prescribed salary as per the Government regulations. Cumulative effect of these schemes resulted in providing faculty and staff financial comfort wherein there is a scope for earning more through consultancy, commercialization of technologies and performance.

Implementation and Results in Vishwakarma Institute of Technology Pune

The process of implementation was initiated in the year 2003 in terms of process for acquiring academic autonomy. In parallel curriculum and supporting academic structure was developed with the involvement of faculty members and stake holders. The scheme for deputation of faculty members for higher studies was initiated in 1996 wherein till date 30 + faculty members have secured Master's and /or Ph D from IITs. The publications in international journals and conferences number was increase by 70%. Total of 9 patent applications were filed with faculty and students as inventors. By virtue of contribution by the faculty, VI, Pune was recipient of the World Bank assisted project known as Technical Education Quality Improvement Programme (TEQIP). The first-of-its-kind initiative of VI, Pune of initiating intellectual property rights in technical education was honored by the State Government as the "Best Initiative". The institute is ranked amongst top 5% TEQIP institutes in India. The quality of education imparted also enhanced and the indicator of this reflected in students of higher merit opting for VI, Pune.

The curriculum developed by faculty resulted in seamlessly integrating facets of intellectual, social, spiritual and physical personality development with a aim of imparting knowledge, skills and developing character and values in students. The electives known as General Proficiency and Professional Development were introduced in the novel curriculum. The course offered under the first elective, Professional Development aims at developing skill sets complementary to the core technical inputs in the students that are demanded by the industry. The courses offered under the second elective, General Proficiency aims at nurturing skills and ability self confidence, communication skills and to work in group / team. Overall impact is seen in terms retaining more than 220 faculty members in the institute since initiation of this process.

The present model has resulted in naturally drawing the faculty, administrative, supporting staff wherein combination of them that forms epicenter of the engineering institution in the process of grooming. This has immensely contributed in the enhancement of the quality of education for the benefit of all.

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