

Quality Enhancement In Engineering Institutions Through Knowledge Management And Total Quality Management

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Abstract

In today's competitive environment there is a need to excel in order to survive. To excel, an engineering institution needs to focus on all parts of the institution, optimizing all of its resources. Human resource are the greatest assets of an engineering institution, because, through human resources all other resources are converted into utilities. The management of knowledge in businesses is an important and necessary factor for organizational survival, and to maintain the competitive advantage, organizations need a Total Quality Management (TQM) approach that views knowledge as a potential source of competitive advantage. Knowledge Management (KM) can be viewed as the process of identifying, organizing and managing knowledge resources. We have come to realize that there are only two things (KM&TQM) that need to be practiced in order to achieve excellence in engineering education.

Keywords: Knowledge Management, TQM, Engineering Educational Institutions

1 Introduction

In the development of society over the years, knowledge and information have been playing a vital role. Knowledge in the form of skills and competencies can only be transferred from one person to another through training, socialization and interaction with people and the environment. The goal of education is to develop the student's moral and social activities. Parents and society are expecting that the scholars coming out of institutions must have very good knowledge on the subjects as well as better behaviours. In order to achieve these goals the institution has to organize and carry out certain activities: academic, co-curricular, managerial and so on. The quality, skills, competencies, values and attitudes of human resources are very important prerequisites for successfully carrying out these activities. In today's knowledge economy

knowledge is power and power brings success. The difference between failure, survival, and success is the way the engineering institution uses its knowledge as well as quality system. The aim of both KM and TQM is to use existing resources in an efficient and effective manner. The responsibility of the institution is optimizing students' as well as faculty knowledge potential in the finest manner that it could be achieved by the adaptation of KM and TQM concepts in engineering educational institutions.

2 Problem Faced By The Institution

Today, the mission of every engineering educational institution is to provide quality education and also to develop the students' professionally superior and ethically strong technocrats with an ability to adapt into an intellectually and technologically challenging

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environment. Unfortunately, overall performances are not satisfactory in the majority of the institutions. The reason is that they are not practicing Knowledge Management and quality management system. In this paper, we have suggested this is the right time to put into practice KM and TQM concepts in engineering education to improve the quality level of performance in the academic activities.

3 Essence of Knowledge Management

"The real value of an organization will lie in its people's ability to think and learn"

- Peter F. Drucker

"The wealth of a nation is in the skill of its people"

- Jawaharlal Nehru

The above statements of the two great people vouch that knowledge learning is one of the important keys to success. Knowledge management is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the organization's objectives. The knowledge to be managed includes both explicit, documented knowledge, and tacit, subjective knowledge. Success in an increasingly competitive market place depends critically on the quality of knowledge, which organizations apply to their key business processes. For e.g., the supply chain depends on knowledge of diverse areas including raw materials, planning, manufacturing, distribution. Likewise engineering institution development requires knowledge of faculty, proper teaching methodology, infrastructure and quality management practices etc. Engineering education should emphasize knowledge management in order to enhance the learning ability of the institution and to respond to challenges through knowledge creation, inventory, diffusion and transfer. Knowledge management has two variables one-knowledge assets and the other as to how to manage and make use of these assets to get maximum

returns. The main function of KM is knowledge conversion processes that act upon the assets. These processes include developing knowledge, preserving knowledge, using knowledge and sharing knowledge. The authors of this paper explore KM from the perspective of operational processes, that is, the basic input, transformation process and output. At the input end, we have a combination of knowledge of customer's needs and expectations, knowledge of students and resources (faculty and infrastructure etc). The following paragraph explains how the knowledge conversion process is to be carried out in engineering institution as shown in figure 1. The main process of engineering institution is intensive coaching in theory and practical works. This could be achieved by conducting set of programmes for knowledge development of staff and students.

- Students are the focal point of an institution. During the period of course study, students' knowledge should be developed by conducting frequent seminars and counselling to gain explicit knowledge and also to conduct personality development programme, technical symposium and Quiz programme. The arrangement of industrial inplant training programme through Industry-Institute Cell, students can get ideas from technical as well as personal behaviour of the industrial culture.
- With reference to faculty, the knowledge of the staff can be improved by conducting faculty improvement programmes. Furthermore, regular seminars and workshops must be conducted to give them both experience and involvement in the subject matter and also as a supplement to research activities. Faculty members should be helped and encouraged to undertake industry projects from time to time. An adequate amount of interaction between the institute and industries must be established to give staff and students proper view or ideas

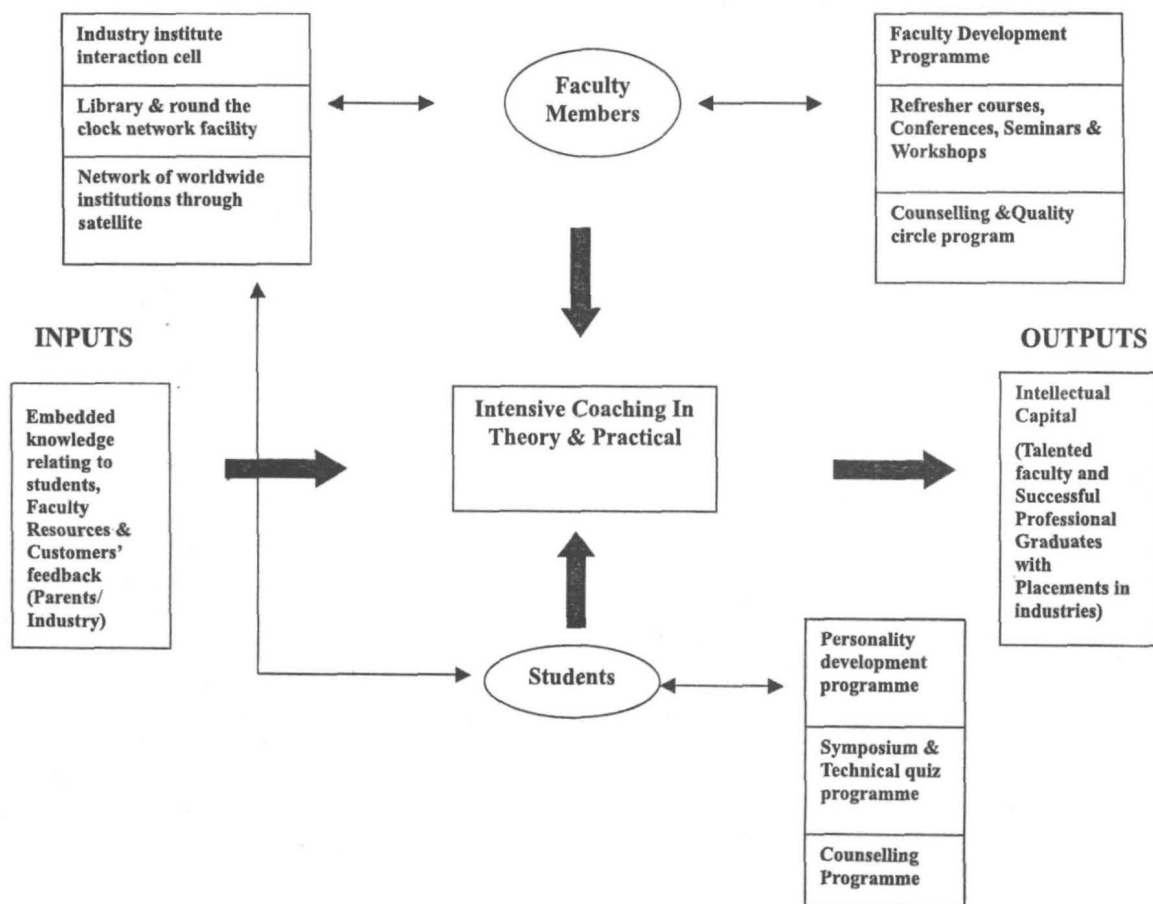


Figure 1: Knowledge Management Processes in Engineering Institution

concerning the industrial field. Along with these, proper library facilities must also be provided. Through the provision of library facilities, proper guides and references are available in plenty to both students and staff to give them more knowledge on a larger scale. The overall attitude and work culture of the teaching and non teaching faculty must be improved through counselling and quality circle programmes. The main purpose of

the quality circle programme is to solve academic related problems by sharing knowledge among employees. At present some of the well established institutions are connected with world famous universities for enriching their knowledge in latest technical areas. In this paper, we have suggested every technical institution must make a connection with world famous universities for improving overall performance of the education through knowledge conversion among emeritus

academicians.

- A well maintained knowledge conversion process would result in high performance of the engineering education. This contribution of knowledge by all people at different levels in an institution leads to develop their skills and provide quality education to the students to make them as the intellectual capital of the society that make the students as successful professionals.

4. Total Quality Management

Total Quality or Total Quality Management is an approach to improve the effectiveness and flexibility of the organization as a whole, through total employee involvement in holistic terms in all aspects, processes and activities. TQM, the launch vehicle of total quality, is both a philosophy and a set of guiding principles that reflect the foundation of continuously improving institutions. Now all engineering institutions have very good objectives of Quality Functions in Engineering institution for example, they are given below:

- To generate efficient and effective engineers to the society.
- To support industry – institute interaction.
- To develop leadership and administrative capacity for faculty as well as students.
- To develop continuous improvement system.

In educational institutions, ISO 9001 means quality assurance in servicing where suppliers capability is demonstrated through quality system to the buyers (i.e. parents and industry owners). Being an ISO 9000 institution, satisfying all the accreditation requirements, it looks as a right system. It is always debatable whether it is better to implement TQM or ISO 9000 first. ISO 9000 need not be the enemy of TQM. If institutions are planning towards Total Quality Management, they can use ISO 9000

as a vehicle. TQM looks at the corporate culture and ISO 9000 looks at the corporate system and together they help the institution to become world class. In the present situation all the educational institutions have got ISO certificates. But the performance level of institution is not good due to lack of awareness about quality management system. The above mentioned objective could be achieved through effective use of TQM principles in an institution. They are given below:

4.1 Top Management Commitment For Quality

The programme cannot start without the boss's commitment. So the top management must be involved in it. The duty of top management is to create awareness about TQM concepts and the individual role in achieving TQM in education. The important concepts in the attempt to achieve quality in engineering institutions are the mission statements. The mission statements are the guiding principles of the institution. Every educational institution should have very clear mission statements. The top management determines the mission statements. At that time, educational institutions should keep their objectives tight. The objectives should be specific, measurable, achievable, realistic and time related. In the view of TQM, the top management approach should be planned one. In educational institution, quality planning can start in any one of the departments such as administrative, library and engineering departments. After planning, the process should be turned over to the people concerned. If at all there is any deficiency in the original planning, it is to be identified and top management has to take corrective action. From that, the institution can attain desired objectives related to mission statements.

4.2 System For Quality

The management approach should be system based one. Identifying, understanding and managing interrelated processes as a system, helps in the institution's effectiveness and

efficiency in realizing its objectives with support of ISO 9001 elements which is a corporate system for quality and to ensure the quality assurance in educational service.

4.3 Leadership For Quality

The success of any institution is dependent on the quality of leadership. Dynamic and effective leadership is a major segment of the success because leader has to direct and extract required work from various levels of subordinates. Leadership is the focus of activity for achieving set goals. So the institution must have good leadership for quality improvement in engineering education. Quality leadership demands more and more upgraded quality levels as a way of life through the institution.

4.4 Team Work For Quality

The duty of management is creating teamwork among employees. It boosts employee morale. It reduces conflict and infighting. It pushes authority and responsibility downwards and it provides better and more balanced solutions. The management should develop organized problem solving approach through teamwork that is used to solve any quality problems in the institution and to reduce cost of quality.

4.5 Training For Quality

It is necessary to define the type of training employees' need in order to actively carryout their roles in the quality improvement process. The teaching, non-teaching and administrative people must be educated and trained for avoiding mistakes in the academic activities as well as developing performance. The education and training of all the employees from the top to bottom are the fundamental building blocks for successful implementation of TQM.

4.6 Control of Quality

Every engineering institution should have a Wisdom Cell for maintaining excellence in academic performance. At the same time, each

quality improvement team with use of statistical and management tools should control quality performance in academic activities.

4.7 Rewards For Quality

An appropriate system of recognition and reward is critical to any educational institution. TQM programme, particularly as the quality improvement process offers greater involvement to ordinary working people. Positive reinforcement through recognition and reward is essential to maintain achievement and continuous improvement. The recognition and rewards have a powerful motivating effect on people at work.

4.8 Continuous Improvement For Quality

The institution has to adopt proactive approach to continually improve the efficiency of QMS through the use of quality policy, quality objectives, audit results, analysis of data, corrective actions and preventive actions and the management review. The following benefits due to implementation of TQM philosophy in educational institutions are:

- Enhancement in the morale of the students and staff.
- Improvement in staff performance.
- Improvement in quality of teaching.
- Increased customer satisfaction.
- Improvement in financial, purchasing, admission and administrative processes.
- Reduction in costs.
- Enhancement in team working culture.
- Empowerment of people at all levels.

5.0 Conclusion

Development in every country depends mainly on the education of its people. Educational institutes play essential role in

development. Education is a life long process. Quality in education particularly in the case of engineering educational institutions is not expensive but it needs hard work, commitment and dedication on the part of all concerned in the institutions. The Noble laureate on economics Dr.Amartya Sen remarked: "University education in India is in a state of crisis. It is a deterioration of quality. When it comes to higher education, there is no escape from seeking the highest quality we can get." If the institution adopts KM and TQM concepts then it is called as a learning institution that leads to overall better performance. An educational institution becomes a centre of excellence only through the concerted and collective efforts of all the stakeholders and also put into practice continuous quality improvement tools such as KM & TQM.

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