

9. QUALITY CONTROL CIRCLES - A TOOL TO IMPROVE QUALITY OF TECHNICAL EDUCATION

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Abstract

The present paper is written with a view to emphasize importance of Quality Control Circles (QCC) to improve quality of technical education. The material presented is the result of extensive study carried out while working as Quality Circle group leader in the institute. The quality circle concept has been accepted in the institute to make the student a total quality person. The Quality Control Circles are shown to have potential to transform today's staid education scenario by inculcating quality awareness amongst the students and teachers. Some of the issues focused during study are, attendance in the class, study habits of students, maximum failures in specific subjects, effective conduct of experiments, placement of students and communication and personality development of students. The 12 step QC methodology if applied effectively gives feasible solution for such problems to implement them. The QC tools such as Pareto diagrams, Fishbone diagrams, brainstorming, Deming cycle etc. are equally good as they are in industries, only difference is that gain is not measured on monetary basis as it is applicable for industries.

The ultimate benefits which one is expected to get through introduction of QCC concepts are growth of institute, resolution of problems, and satisfaction of parents, along with team building, attitudinal change, training and leadership qualities in students which are the basic objectives of Quality Circle activities. The Quality Circle as a tool for quality assurance and process improvement may also be able to improve faculty identification, help to develop teaching standards and thus decrease dissatisfaction, as the basic goal is to achieve academic excellence.

Key Words: Technical education, Quality awareness, QC methodology, Academic excellence, Teaching standards

1.0 INTRODUCTION

India is witnessing substantial change in the economic development due to globalization. One of the key requirements towards growth of industries is efficient and able technical human resource. Trained and educated on sound lines, a large population can itself become an asset in accelerating economic growth and in ensuring social change in desired directions. Technical institutes have to play an

important role to ensure quality input in the form of technically qualified human resource but unfortunately there is a question mark on quality of technical education and its contribution in economic development. Today, there is shortage of efficient technical manpower demanded by corporate sectors, but it is required for those available to be the technocrats with an ability to adapt intellectually and technologically to the changing environment. The concern for quality emerged

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from the competition is not limited to production of goods but it has spread wide in all areas of life, including services and education. Now, it is the responsibility of technological universities in India to improve quality of technical education to meet changing requirements of time. Though efforts are continuously put into action, they are needed to be accelerated. Application of Total Quality Management tools and in turn 'Quality Circles' is one of the key towards achieving excellence in technical education by improving quality level of performance in academic activities. Quality Control Circle, as it was formerly called, originated in Japan after Second World War in January 1949.

Fruitful results of implementing Quality Circles are well known in terms of both tangible and intangible gains in big giants like Parle group, Kirloskar group, Hero Honda and many more. Although Quality Circles have their roots in industry, quality circles have a promise as a pedagogical tool that make students involve voluntarily and increases the satisfaction in them. But, the concept of Quality Circles if applied effectively and efficiently, can be equally good in improving image of universities imparting technical education to the large mass of students. Quality Circles in technical education aim at making student a total quality person through improvements in present teaching-learning process and making students responsible for their own learning and increasing class participation. The main purpose of quality circle programme is to solve academic related problems by sharing knowledge among employees and to achieve the goal of knowledge transfer to the students efficiently and effectively. Rajarambapu Institute of Technology, a renowned technical institute in Maharashtra, known differently for its academic discipline, is implementing Quality Circle in education from last 15 years consistently. During this tenure, institute has achieved a prestigious status for being one of the very few institutes running Quality Circle activities successfully and bagged prestigious awards, as a return. The present paper is written with a

view to emphasize importance of Quality Circle as a tool to improve quality of technical education and to promote its movement in technical institutes for achieving academic excellence.

2.0 QUALITY CIRCLE IN INDUSTRY Vs. EDUCATION

Quality Circle is a small group of persons from same work area who meet regularly and voluntarily to discuss and solve work related problems. Quality Circles in industry have been known to increase productivity, improve quality, boost employee morale and serves as a human resource development tool; the same benefits may be accrued by implementing them in education also, only the way of assessing its effectiveness is going to be different. Model given below depicts input-output relationships in manufacturing and service (Education) sectors. The service sectors are concerned with processes and not products. Technical education system achieves transformation of students into technically qualified human resource through a conversion process called as teaching-learning process. The inputs to engineering education are, men (faculty, supporting staff), machines (laboratory equipments), material (teaching aids) and methods (case studies, seminars). Whereas industries are successfully implementing quality circle programmes for dispatching a quality product with low cost of quality, it is equally beneficial in engineering education, particularly for making student a total quality person and building quality into technically qualified human resource. Formation of staff and student quality circle make them feel that their views are equally important in institutional development.

Contrary to the manufacturing, in academics, it is not worthwhile to measure the outcome in terms monetary units since gains in two are of different nature. Now, about the lifespan of quality circle, it is usually one semester in classroom quality circles whereas in industry and business same volunteers can be continued for several years. Whereas

workers can see results of their effort over time and use statistical data to assess effectiveness of improvements suggested, the significant enhancement in course quality by virtue of classroom quality circle can be archived and communicated to future QC members in subsequent classes. The difference in quality circles is clearly distinguished from Fig. 1 and Fig. 2.

will start planning for new projects to contribute towards quality in learning.

In Rajarambapu Institute of Technology, staff quality circles are formed with at least one quality circle in each department. Quality circles are structured with Principal as coordinator of quality circles activities and each head of the

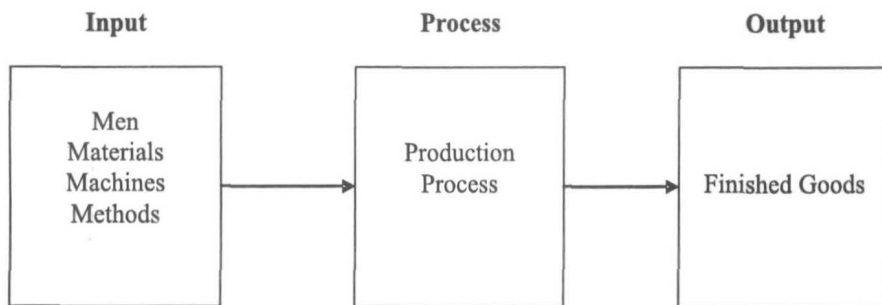


FIG. 1 Input – Output Relationship in Manufacturing

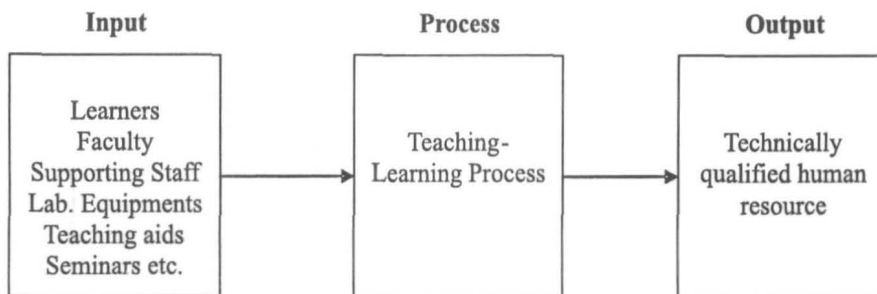


FIG. 2 Input – Output Relationship in Service (Engg. Education)

3.0 STAFF QUALITY CIRCLE

Teacher is at the pivot of teaching-learning process and he shapes future of students. To satisfy the goal of knowledge effectively, teacher needs to be conscious about quality of teaching. Quality circle comprising of staff members enables them to involve in managerial decisions related to teaching learning. In fact, it is necessary to start discussion of quality in education as a concept among faculty members. To impart quality education to budding technocrats, it is required to develop a culture wherein faculty members

department as facilitator for the concerned team. Every quality circle comprises of 5 to 10 faculty members with leader and deputy leader selected among them unanimously. Circle members meet regularly for at least an hour. To manage upon scarcity of time available they prepare themselves to spend extra time after regular working hours. Effective application of 12-step Qc methodology helps in finding out appropriate and feasible solution for the problem concerned.

Academic related problems are addressed and an appropriate solution is found using

organizational problem solving approach. Problems in academics are categorized as:-

- ◆ Staff related,
- ◆ Student related,
- ◆ Laboratory Development related,
- ◆ Management related.

Here are some of the problems identified and processed under QC methodology and solution successfully implemented at R.I.T. Sakharale

- ◆ Conversion of study type experiments into performing one,
- ◆ Training to supporting staff,
- ◆ Improving results of first year engineering students,
- ◆ Developing software for department information system,
- ◆ Communication skill improvement,
- ◆ Personality development of students,
- ◆ Laboratory Development problem,
- ◆ Improper study habits of students,
- ◆ Repeated failure of students in specific subjects.

Following are the Qc tools and techniques and the concerned area of their application.

- Brainstormi - Problem identification, Development of Solution
- Histogram - Problem Selection
- Why-Why Analysis - Problem Analysis
- Fish-Bone Diagram - Finding causes and sub causes
- Pareto Analysis - Finding root cause
- 5 W -1 H Principle - Trial Implementation
- Data Collection - Problem Selection, Problem Analysis

After successful implementation of quality circle approach to solve academic related problems, some of the tangible and intangible gains accrued are:-

- ◆ Recognition of the institute at national and international level by participating in several

competitions,

- ◆ Team building among staff members and spreading message of work together for progress,
- ◆ Boost employee morale,
- ◆ Reduced conflict and infighting,
- ◆ Joy of creative fulfillment.

4.0 STUDENT QUALITY CIRCLE

Traditional teaching methods are lacking in effective knowledge transfer due to one way communication from teaching side. But enhancement of course quality and quality of teaching depends to the greater extent on a system to assess its effectiveness at the receivers end and seeking important suggestions to overcome lacuna. Student involvement is the most important condition for promotion of excellence in education. The more students are involved in education, more intensely they engage in their education to make learning happen. The use of quality circles in classroom is one way of increasing student involvement. Classroom quality circle is small voluntary group of students enrolled from the same class who meet regularly to provide continuous student generated feedback to the teaching team in order to improve course content, structure and environment in the class.

Student quality circles are formed one for each class, with 5-10 student members in each circle. The quality circle is structured as one of the members is selected as leader and the concerned staff member as facilitator. The selection of the members is based on voluntary participation part of it. Apart from this, selection can be done with a view to form diverse committee in terms of gender, class rank etc. In the beginning of every semester, concept and purposes of quality circle along with its background and operation, needs to be explained to the member to ensure appropriate results in the end. The quality circle acts as a feedback mechanism for teaching team and it provides an opportunity for students to share their inputs in a confidential manner throughout

the semester. The circle members accept the responsibility of soliciting the feedback from remaining class members in groups, each circle member assigned with few students. The QC members conduct the meeting at regular intervals during the semester to collect and process data using appropriate quality circle tools and techniques. The QC members are required to take a proactive approach in soliciting feedback from class members and should see that whole process is carried out in anonymous fashion.

The feedback obtained is to be shared by QC members with teaching team and discussion is expected regarding incorporating suggestions accrued and their implementation. Here, what is important is teaching needs to be more flexible, open and responsive to student observations, their opinion and suggestions to strengthen the objective with which quality circles are setup.

The classroom quality circles are beneficial for the reason that there is positive interaction between staff and students. Some of the inputs, which the classroom quality circle team receives for ensuring better teaching learning process, are;

- ◆ Type and frequency of written assignments,
- ◆ Content of lectures,
- ◆ Assessment methods to be used,
- ◆ Frequency, duration and period of class tests during semester,
- ◆ Need to conduct extra evening sessions on 'How to Study',
- ◆ Extra lecture series for slow learners and those for those with backlog subjects,
- ◆ Providing lecture outlines and lecture material in the beginning of semester,
- ◆ Utilization of lecture hours more for discussion.

Finally, the gains expected to be achieved due to effective implementation of student quality circles as above are;

- ◆ Improvement in quality of teaching in the class,
- ◆ Improvement in students learning of course material,
- ◆ Enhancement in student's involvement,
- ◆ Increased students morale and satisfaction
- ◆ Enhancement in course quality and structure,
- ◆ Better way of utilizing student's input for restructuring course content and pedagogical methodology,
- ◆ Improvement in climate of learning by open communication between students and faculty members,
- ◆ Opportunity for students to share their inputs in a confidential manner.

5.0 PROBLEMS ASSOCIATED WITH CIRCLE

Its fact, though it is not a good sign that quality circle movement in academics has not much progressed, off course with few exceptions, compared to that in industrial sector. The immediate reason for this is the mentality to compare the outputs received more or less in terms of monetary achievements and savings after implementation. But, this is not applicable in educational sector as input and output in both are different as shown in fig 1. Academic institutes are not profit making organizations, so the funds required to be put in for quality circle activities are not affordable for all the institutes. Government is expected to take initiatives under these circumstances to promote quality circle in education, which is not happening, at present. Human resource mentality for quality circle in academics is unfortunately not so good due to lack of awareness and training regarding quality circle

approach and its usefulness to bring the positive change in the service, they are providing. The faculty members may be reluctant due to thinking that returns are not monetary as opposed to those in industry and business sectors.

Many academicians view education as an intangible, and so, not applicable to the productivity boosting techniques (such as total quality management tools) employed by industry. One more barrier to implement quality circle in education is due to tendency of educators to emphasize on individual achievements and personal importance, which may run contrary to group participation. Further, highly educated circle members may hamper circle progress due to their tendency to become over philosophical about the purpose of quality circle. Finally, academic schedule is not particularly conducive to quality circles, wherein most busy period of the term end and vacation breaks are not able to maintain continuity in quality circle activities. But, apart from all above things, quality circles are equally important and equally beneficial in academics due to the fact that one of the input (good quality technical human resource) to industry is the output (qualified technocrats) of the engineering institutes.

6.0 CONCLUSION

Quality Circle as an organized problem solving approach has been implemented successfully in industry and business over the years, but the academic institutes are not serious enough in view of its application in education. Economic and overall development of any country largely depends upon providing quality education, particularly in engineering institutions. TQM concepts in general and Quality Circle in particular are required to be adopted in engineering institutions. Quality circle programme are best in improving overall attitude and work culture of teaching and non-teaching staff. Its time for technical institutes not to rely on external agencies to initiate quality improvement programme but to opt for TQM

concepts like quality circle as a part of internal efforts. Staff and student quality circle have been explained thoroughly as some of the ways of application of quality circle in academics, but this is just an illustration. With change in mentality of people to view TQM concepts less important in service sectors, few problems associated right now with its use will also be overcome. Quality circle activity, if applied with clear objectives and in right manner, definitely have the potential to improve quality in terms of enhanced student involvement, team building, better understanding, improved course quality, interactive learning and improved quality of teaching.

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8.0 REFERENCES

1. Schemidt S.J. et al, Using quality circles to enhance student involvement and course quality in large undergraduate food science and human nutrition course, Journal of food science education, Vol.1, 2005, pp. 2-9
2. Deb S.K, Niladri Chakrabarthy, Ensuring Quality and Productivity improvement practices in technical education- A system, approach, Indian Journal of technical education, Vol. 29, April –June 2006, pp. 1-5.
3. Dr. Mrs. Kulkarni S.S., Achieving

- Excellence in teaching-learning through innovative practices, The Journal of engineering education, Jan. 2007, pp. 10-15.
4. Dr. U Surya Rao, A Pal Pandi, Quality enhancement in engineering institutes through Knowledge Management and TQM, The Journal of engineering education, Jan. 2007, pp. 10-15.
 5. Ganapathy K, Quality Circle handbook for new Millennium, Quality Circle Forum of India (QCFI), Secundarabad
 6. Narayana V et al, Problem Solving Techniques, Quality Circle Forum of India (QCFI), Secundarabad.
 7. Utpa, Quality Circle, New McGraw Hill Publishing Company Pvt. Ltd., New Delhi
 8. B.L. Maheshwari, Quality Circle, Oxford and IBH Publishing Pvt. Ltd., New Delhi.
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