VOLUME-6 | ISSUE-4 | APRIL - 2017 • ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

STUDENTS PERFORMANCE ENHANCEMENT USING TQM KNOWLEDGED FACULTY IN ENGINEERING EDUCATION

Engineering

KEYWORDS: TQM in Higher Education, TQM in Engineering, TQM Applications, TQM for Teaching Faculty Members

Mohit Beniwal

Research Scholar, Guru Jambheshwar University of Science & Technology (GJUST), Hisar, Haryana, India

ABSTRACT

The modern era is full of technology and innovations but still the educational institutions are not performing up-to certain quality level. The quality of education is not improving significantly in modern times corresponding to efforts provided by different kinds of educational organizations. The key reason for unsatisfied student's performance is that the new generation of tutors are still using old conventional methods to achieve quality in higher education. But no one is really adopting a better way of teaching as per modern times. The teaching faculty of each educational organizations need to accept the latest trends of teaching that is, delivering lectures by organising smart classes, proper Student to teacher ratio, biometric attendance of faculty members as well as students etc. This paper aims to represent the obsolete quality in the educational organizations due to absence of Total Quality Management knowledge to tutors working there and students studying in educational organizations.

I. INTRODUCTION

With the help of combination of Total Quality Management and Technology, the introduction of quality in education is a quite easy task. The paper represents true records of Student's performance in different subjects taught by permanent faculty & extension lecturers. After going through the whole paper, it will be easy task to assign a permanent faculty for teaching or assigning an extension faculty for the enhancement of Student's performance. Now-a-days each organization, firm or institute is adopting the total quality management for better outputs. TQM helps each & every educational institute for continuous improvement so that a student can be benefitted as well as organization can grow rapidly. Less than 50 % of educational institutes are working with the application of TQM concept. The technology uses in teaching field helps to understand the concept more accurately and precisely. TQM can be a powerful tool to explore students' performance to peak level because quality will be delivered at each & every single step. Quality definition varies from person to person but in common language it is defined as "Fitness for specific purpose of anything."

II. LITERATURE SURVEY

- **Mete B. Sirvanchi**, represents "A critical step in TQM implementation is the operation of customer identification. In addition to customer identification, there are other issues such as leadership, cultural, and organizational issues that tend to create difficulties for TQM implementation in higher education."
- **E. Anderson**, displays the results of a case study to evaluate the effectiveness of a TQM programme in higher education
- **Sitalakshmi Venkatraman**, paper aims to provide a TQM framework that stresses continuous improvements in teaching as a plausible means of TQM implementation in higher education programs.
- **MS Owlia et.al.,** describes the role that quality plays in the higher education sector is becoming more important as the dominance of market orientation leaves no alternative for universities & colleges but to improve their quality while increasing efficiency.
- **SL Ahire et.al.,** prescribed QM (quality management) strategies on a firm's product quality has not been analysed but the contemporary QM literature prescribes the various quality strategies.

III. OBJECTIVES

1. To improve the student performance using SQC & TQM concept.

2. To set-up a relationship between student performance and teacher knowledge.

3. To utilize technology in teaching departments effectively and efficiently.

IV. REASEARCH METHODOLOGY

The present research methodology is as follows: -

1. Research work area selection
2. Collection of data
3. Data analysis and interpretation
4. Graphical Representation
5. Results and conclusions
6. Recommendation's
7. Future work scope

V. DATA COLLECTION, ANALYSIS AND INTERPRETATION

To start any kind of research work, the first thing is to gather the data from each & every reliable resource. The data for research work is collected from the result portal of Haryana State Board of Technical Education. This data represents marks scored by students of 5th semester, branch Mechanical Engineering for a polytechnic college in Bhiwani (Haryana). Three important subjects from mechanical engineering studies are selected i.e. Theory of Machine (TOM), Refrigeration & Air-Conditioning (RAC) and CNC (Computer Numerical Control) Machine & Automation. These three subjects were being taught by three visiting faculty members with code VF1 – TOM, VF2-RAC and VF3-CNC Machine & Automation. There are 60 students in a single class, out of which a sample of 20 students is considered for this hypothesis. The raw data is tabulated below: -

Table 1.1: Students performance in exams

Student Number	TOM	RAC	CNC
1.	13	48	53
2.	08	41	47
3.	17	23	32
4.	29	35	52
5.	28	55	53
6.	19	48	49
7.	12	04	33
8.	07	24	30
9.	30	36	54
10.	17	50	60
11.	23	46	36
12.	08	54	43
13.	11	40	48
14.	10	36	36
15.	19	51	43
16.	10	49	66

17.	32	54	65
18.	07	37	44
19.	38	31	38
20.	38	52	80

The data can be easily plotted on a single chart so that student performance can easily be judged. The curve in green colour represents that maximum students performed well in CNC subject. The yellow colour curve represent that the students performance in RAC is in-between while the orange colour curve clearly describe that the performance of maximum students is not satisfactory. The poor result of students in TOM subject is due to fluctuations in faculty members continuously during the session. Out of 100 marks, a student needs minimum 33 marks to pass the exam paper. In CNC subject, 18 students scored more than 33 marks, so 90% student got passing marks. The output in RAC subject is also 80% because 16 students obtained more than 33 marks in their respective exam papers. Only two students qualified in TOM subject, so the qualifying percentage is only 10%.

Table 1.2: Observations and calculations

Parameter	TOM	RAC	CNC
Arithmetic Mean	18.8	40.7	48.1
Variance	102.86	160.31	157.19
Standard Deviation	10.14	12.66	12.54

The SQC (statistical quality control) also plays a vital role to check for student performance is as per control limits or not. The quality control helps to ensure that student is performing satisfactory or un-satisfactory. If student performance is found un-satisfactory, the faculty member needs to change something so that the performance can be confined to the control limits.

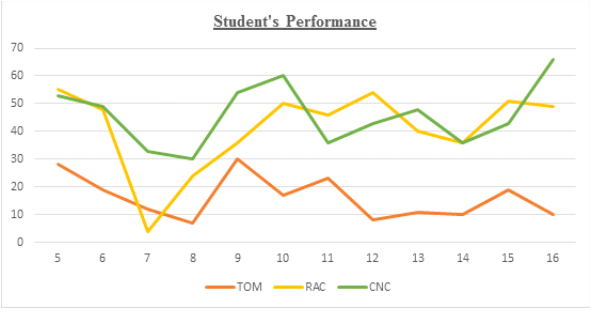

Figure 1.1: Graphical Representation of data

A smaller value of standard deviation means that the data points converges close to the mean value while a higher value suggests that the data points diverges over a wide range of values. The arithmetic mean calculation signifies that average score of student in TOM is approx. 19, so the net output of this subject is poor. It is due to irregularity of faculty member's as well as due to fluctuations of tutor from one faculty member to another. The average score in RAC subject by a student is around 41, so a higher number of students cleared this exam paper successfully. The RAC subject faculty member focuses on taking classes on time, assigning assignment to students at time etc. At last, the mean score of CNC subject is highest i.e. 48, so highest number of students successfully passed their exam paper. It is because the faculty member VF3 followed whole the procedure like VF2. But in addition to VF2, VF3 tutor utilizes the concept of teaching students by power point presentations, explaining some animated video clips to understand the concept theoretically as well as practically.

VI. RESULT AND CONCLUSION

The performance of students was found better in subjects when extension lecturers/guest faculty/resource person/visiting faculty with the key knowledge of total quality management teach them. There is only one subject CNC Machine & Automation in which the whole students successfully pass the exam as it was being taught by Visiting Faculty (VF3). It is easy to conclude that student performance is directly proportional to teacher extent of TQM knowledge. As Per given statistical data, 90 % students got passed in CNC subject as they are being taught by a tutor having maximum extent of TQM subject knowledge as well as its application. A low value of variance means that the data points tend to be very close to the mean and to each other while a high value of variance suggests that data points are very spread out from mean and from one another. It can be concluded that more TQM is implemented in educational field, higher will be the student output. TQM concept will help for continuous improvement in knowledge of engineering aspirants.

VII. RECOMMENDATIONS

All educational institutes must recruit the faculty members based on their percentage of TQM subject knowledge. Someone who scored better in academics does not mean that he/she is a good tutor. Before recruitment, a scientific procedure must be planned to know the capability of a teacher into each possible field. The assigning the job to best person in teaching profession, a demonstration class is the best choice so that the students will also participate in selection process because at last students need to study from their teachers, not the administrative departments. Don't recruit teachers by old conventional methods. We are heading towards smart India, so there should be a change in selection process of faculty members.

VIII. SCOPE OF FUTURE WORK

The proposed work consists of only single polytechnic college and single branch that is mechanical engineering. It can be easily extended to many educational institutions as well as many branches of engineering field. The more precise and accurate results can be obtained if the proposed work is extended to more number of educational institutions and more branches including computer science engineering, electronics engineering, electrical engineering etc. The technology used in north India in teaching department is less as compared to south India. That is the key reason why south India offers quality education but north India education system is still developing ideas so that quality extent can be efficiently and effectively increased.

REFERENCES

1. Anderson, E. (1995). High tech v. high touch: a case study of TQM implementation in higher education. Managing Service Quality: An International Journal, 5(2), 48-56.
2. Ahire, S. L., Golhar, D. Y., & Waller, M. A. (1996). Development and validation of TQM implementation constructs. Decision sciences, 27(1), 23-56.
3. Owlia, M. S., & Aspinwall, E. M. (1997). TQM in higher education-a review. International Journal of Quality & Reliability Management, 14(5), 527-543.
4. Kanji, G. K., Malek, A., & Tambi, B. A. (1999). Total quality management in UK higher education institutions. Total Quality Management, 10(1), 129-153.
5. Aly, N., & Akpovi, J. (2001). Total quality management in California public higher education. Quality Assurance in Education, 9(3), 127-131.
6. Cruickshank, M. (2003). Total quality management in the higher education sector: a literature review from an international and Australian perspective. Total Quality Management & Business Excellence, 14(10), 1159-1167.
7. Sirvanci, M. B. (2004). Critical issues for TQM implementation in higher education. The TQM Magazine, 16(6), 382-386.
8. Venkatraman, S. (2007). A framework for implementing TQM in higher education programs. Quality assurance in education, 15(1), 92-112.
9. Ali, M., & Shastri, R. K. (2010). Implementation of total quality management in higher education. Asian Journal of Business Management, 2(1), 9-16.