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SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

The emergence of higher secondary education in government, aided and unaided schools in Kerala in 1990-91, was consequent to the process of bifurcation of the pre-degree classes from the collegiate education, following the implementation of the National Policy on Education, 1986. The establishment of higher secondary department in 1990 provided a statutory uniformity, systematic scheme of functioning and administrative hierarchy to the higher secondary education in the state. A number of quality improvement programmes and schemes have been implemented in education at the initiative of the government. Improvements have been introduced in the school education by applying the concepts of TQM such as, continuous improvement, teamwork and customer focus. The introduction of continuous and comprehensive internal evaluation of students and the system of planning for classroom transactions together with, the learner centered and activity oriented teaching methodology ensure continuous improvement in teaching and learning. The activity based, process oriented and learner centered pedagogy introduced in the schools from the first standard onwards and which was continued in the higher secondary classes, from the year 2005 (SCERT, 2006) and other quality upgradation initiatives through technology like SPARK, HSCAP etc and investment in infrastructural improvement of schools, indicate customer orientation. In 2004, following the “Total Quality”, envisaged by the educational authorities, a vision-mission statement was developed in a Training Need Analysis (TNA)
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Workshop and ever since it has been used in all official documents (Government of Kerala). The vision envisages a central agency of the state government to promote all round excellence in higher secondary education, by establishing appropriate philosophies, adequate institutional network, effective administrative systems, and well qualified, competent and motivated staff, necessary to carry out academic and administrative responsibilities. The mission provides to serve as a professional institution in formulating and maintaining the standards of higher secondary education and in providing need-based, time-bound, effective and sustainable services to the students and teachers (www.kerala.gov.in). The vision and mission of the higher authorities are permeated to the implementation level through the participation of teachers in clusters, enabling teamwork in the education system. Thus, the application of the concepts of TQM in higher secondary school education are being experimented on a large scale in Kerala. The present study is pursuing into the important tenets of TQM initiated in higher secondary school education in Kerala to elicit the outcome of the initiative in terms of certain established parameters.

Objectives of the Study

The study had the following objectives in view;

1. Assess the continuous improvement in teaching, teachers, evaluation and infrastructure, as part of application of TQM in higher secondary school education in Kerala.

2. Examine the team work among teachers, as part of application of TQM in higher secondary school education in Kerala.

3. Examine the customer satisfaction attained, as part of application of TQM in higher secondary school education in Kerala.
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4. Identify the problems in the implementation of TQM in higher secondary school education in Kerala.

Hypotheses

The following hypotheses are formulated for the study.

1. The overall continuous improvement achieved, as part of application of TQM in higher secondary school education in Kerala, is moderate.

2. The continuous improvement in teaching, teachers, evaluation and infrastructure, as part of application of TQM in higher secondary school education in Kerala, is the same, irrespective of, the type of ownership of the schools, location of the schools and subject taught.

3. The overall teamwork achieved among teachers, as part of application of TQM in higher secondary school education in Kerala, is moderate.

4. The opinion of the teachers with regard to overall teamwork, as part of application of TQM in higher secondary school education in Kerala, is the same, irrespective of, the type of ownership of schools, location of schools and subject taught.

5. The overall satisfaction level of teachers and students achieved, as part of application of TQM in the higher secondary school education in Kerala, is moderate.

6. The overall satisfaction of teachers in higher secondary school education in Kerala is the same, irrespective of, the type of ownership and location of schools.

The study is descriptive in nature, examining the three important tenets of total quality management, viz; 1. Continuous Improvement, and 2. Teamwork and 3. Customer satisfaction. The opinion on these three tenets is
elicited from the teachers of government, aided and unaided higher secondary schools, coming under the Directorate of Higher Secondary Education in Kerala. The satisfaction level of students and their parents of these schools are also assessed. The opinion of the respondents is marked on a five point Likert-type scale. Out of the total number of 1907 higher secondary schools in Kerala (government, aided and unaided higher secondary schools coming under the Higher Secondary Department of Government of Kerala), about 1.5 per cent of the schools (30 schools) are selected for the sample, through a multi-stage sampling process. Schools are included in the sample proportionately, from government, aided and unaided sectors. From each of the selected schools, 10 teachers, 10 students, 10 parents are selected. Thus data are collected from a total number of 900 candidates, comprising, 300 teachers, 300 students and 300 parents. Percentage analysis and descriptive statistics are computed for identifying the nature of the data. The main statistical tools, used for testing hypothesis, are Z test, one way analysis of variance (ANOVA), along with least significant difference test, for comparison between more than two groups and independent t test for comparing between two groups and also correlation. Factor analysis is used for studying the problems faced by the teachers in the implementation of TQM in higher secondary school education. The major findings of the study from each area are summarized below in four heads.

1. Continuous Improvement
2. Team work
3. Customer Satisfaction
4. Problems in the Implementation of TQM

1. Continuous Improvement

Continuous improvement is assessed in four pertinent aspects of higher secondary school education such as;
Continuous Improvement in Teaching

Continuous improvement in teaching is the systematic process of planning for classroom transactions, implementing, evaluating and re-implementing these plans, continuously, for the purpose of attaining higher level of efficiency and customer satisfaction.

a) The percentage score of continuous improvement in teaching as part of total quality management is 78.69. Continuous improvement in teaching is found to be the same in government (mean 58.55), aided (mean 58.90) and unaided (mean 60.23) higher secondary schools (p value 0.611). It is also found that continuous improvement in teaching is the same in both rural and urban schools and among male and female teachers. Similarly, continuous improvement in teaching is the same among the teachers handling different subjects (p value 0.389). Therefore, the hypothesis, ‘continuous improvement in teaching as part of application of TQM in higher secondary school education in Kerala is the same, irrespective of the type of ownership of the schools, location of the schools and subject taught’, is accepted. However, continuous improvement in teaching is found to be more in the case of younger teachers (age 25-34 years; mean 61.42) and elder teachers (age 45-54 years; mean 64.14) than the middle group of teachers (age 35-44 years; mean 57.87), as the p value (0.044)
indicates significant difference in the level of continuous improvement in teaching among them.

**Continuous Improvement in Teachers**

Continuous improvement in teachers is the improvement attained by the teachers, by attending the faculty development programmes, conducted by the Directorate of Higher Secondary Education and SCERT. The opinion of the teachers about the training sessions is the basis for assessing continuous improvement achieved by them through these faculty development programmes. The percentage score of ‘continuous improvement in teachers’ is at 72.82.

a) The study found that ‘continuous improvement in teachers’ is the same among government, aided and unaided higher secondary school teachers (p value 0.388), among male and female teachers (p value 0.062), teachers of different age groups (p value 0.135) and those teaching different subjects (p value 0.524). Therefore, the hypothesis that continuous improvement in teachers as part of application of TQM in higher secondary school education in Kerala is the same, irrespective of, the type of ownership of the schools and subject taught, is accepted.

b) However, continuous improvement in teachers is more among teachers belonging to the rural area (mean 23.09) than those belonging to the urban area (mean 20.64), as indicated by the p value 0.009. Thus, hypothesis that, ‘continuous improvement in teachers as part of application of TQM in Higher Secondary School Education in Kerala is the same, irrespective of, the location of the schools’, is rejected.
Continuous improvement in Evaluation

‘Continuous improvement in evaluation’ is an assessment of the extent to which students in the higher secondary school education are subjected to continuous and comprehensive internal evaluation as part of the teaching-learning process and continuous improvement in the conduct of practical and terminal evaluation. For this purpose, the opinion of the teachers on ‘continuous and comprehensive internal evaluation’, ‘practical evaluation’ and ‘terminal evaluation’ is gathered.

a) The percentage score of overall continuous improvement in evaluation is 69.02.

b) The percentage score of ‘continuous and comprehensive internal evaluation’ at 63.27 indicates that it is carried on a level, lower than ‘practical evaluation’ (percentage score 72.93) and ‘terminal evaluation’ (percentage score 78.93). Thus there is lesser continuous improvement in ‘continuous and comprehensive internal evaluation’, than the other two types of evaluation. It means this new method of evaluation, introduced as part of quality improvement, is yet to be carried out as envisaged. It can be understood that teacher centeredness still prevail to a certain extent in the classrooms, and that, it has to work on, for being more activity oriented. Out of the three sets of evaluation assessed, ‘continuous and comprehensive internal evaluation’, has got much importance in determining, the extent of ‘continuous improvement in evaluation’, from the perspective of total quality management. This is because; it is this mechanism
which ensures that the output, i.e., the students, at the terminal examination never fails or is of the desired quality.

c) There are striking differences in the conduct of ‘continuous and comprehensive internal evaluation’, by the teachers of different types of schools on the basis of ownership; it is done on a higher scale by the government school teachers (mean 35.98) when compared to the unaided school teachers (mean 32.18) (p value 0.044). But, there is no significant difference in this matter between government and aided school teachers. The findings of factor analysis on the ‘problem of continuous internal evaluation’, also affirmatively shows that, this problem is more for the unaided school teachers (mean 16.73) than aided (mean 15.33) and government school teachers (mean 15.82) (p value 0.015). Moreover, on assessing the satisfaction of the teachers, on ‘workload’ and ‘compensation’, it is found that the unaided school teachers are significantly lesser satisfied than the other two groups (p value less than 0.001). Therefore, the difference in the extent of continuous improvement, in the conduct of ‘continuous and comprehensive internal evaluation’ between government and unaided school teachers arises, due to, the ‘problem of continuous internal evaluation’ and lesser satisfaction on ‘work load’ and ‘compensation’.

d) The difference in the conduct of ‘continuous and comprehensive internal evaluation’ (C.E) is highly significant among teachers, teaching Science (mean 31.84) and other subjects. The conduct of C.E is more among Language (mean 38.71), Humanities (mean
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35.29) and Commerce (mean 34.83) teachers, than among Science teachers (p value less than 0.001).

e) Continuous improvement in overall evaluation is the same, among government, aided and unaided schools (p value 0.169). Therefore, the hypothesis, ‘continuous improvement in overall evaluation as part of application of TQM in higher secondary school education in Kerala is the same, irrespective of the type of ownership of the schools’, is accepted.

f) It is interesting to note that there is more continuous improvement in ‘overall evaluation’, (C.E+P.E+T.E), in the case of Languages than in Science subjects (p value 0.038). Therefore, the hypothesis that ‘continuous improvement in overall evaluation as part of application of TQM in higher secondary school education in Kerala is the same, irrespective of the subject taught’ is rejected. One of the reasons for such differences is that the extent of ‘continuous and comprehensive internal evaluation’ is more in Languages than in Science subjects. The ‘problem of vast syllabus’, studied through factor analysis is also more in the case of Science subjects when compared to Languages (p value less than 0.001), which acts as a major constraint in the implementation of continuous and comprehensive internal evaluation process in the case of Science subjects.

Continuous Improvement in Infrastructure

‘Continuous improvement in infrastructure’ is an assessment of the incremental changes brought about in the infrastructure of the school, comprising of buildings (classrooms, staffrooms, and toilets), common space,
laboratories, playground, library and water including drinking water, electricity supply, computer and other technology.

a) The study found that, when compared to the opinion regarding ‘continuous improvement in teaching’ (percentage score 78.69), ‘teachers’ (percentage score 72.82) and ‘evaluation’ (percentage score 69.02), the improvement in ‘infrastructure’ (percentage score 68.53) is way behind.

b) In the matter of continuous improvement in ‘teacher’, ‘teaching’ and ‘evaluation’, the government, aided and unaided schools are on an equal footing. However, the ‘continuous improvement in infrastructure’ in government schools (mean 20.97) is inferior to aided (mean 26.95) and unaided (mean 25.08) schools and the difference is highly significant, since p value being less than 0.001. Therefore, the hypothesis, ‘continuous improvement in infrastructure as part of application of TQM in higher secondary school education in Kerala is the same, irrespective of, the type of ownership of the schools’, is rejected. It should be specifically noted that the difference between government, aided and unaided higher secondary schools lies only in the differences in continuous improvement in ‘infrastructure’ and not in ‘teaching’, ‘teachers’ or ‘evaluation’.

c) The opinion on continuous improvement in infrastructure is not significantly different between rural and urban higher secondary school teachers (p value 0.308) and teachers teaching different subjects (p value 0.524). Therefore, the hypothesis, ‘continuous improvement in infrastructure, as part of application of TQM in
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higher secondary school education in Kerala, is the same, irrespective of, the location of the schools and subject taught’, is accepted.

d) The ‘overall continuous improvement’ is the aggregate of the continuous improvement secured in ‘teaching’, ‘evaluation’, ‘teachers’ and ‘infrastructure’. The ‘overall continuous improvement’ achieved as part of application of TQM in higher secondary school education in Kerala is above moderate. The Z value (14.994) is found to be significant and the mean (3.55) is greater than the central value (3) of the scale of measurement. Therefore the hypothesis that overall continuous improvement achieved, as part of application of TQM in higher secondary school education in Kerala, is moderate is rejected.

e) ‘Overall continuous improvement’ is the same in government, aided and unaided schools and in urban and rural higher secondary schools in Kerala.

Team work

Team work among teachers, as part of application of TQM in higher secondary school education in Kerala, has been examined under two levels, at the school resource group level and at the ‘cluster’ level.

a) The ‘overall teamwork’, comprising of teamwork at school resource group level and team work at cluster level, achieved among teachers as part of application of TQM in higher secondary school education in Kerala, is moderate. Z value (1.089) corresponding to teamwork is not significant and the mean (3.07) is considered to be equal to the central value (3) of the scale of measurement, which
indicates that the level of ‘teamwork’ in higher secondary school education in Kerala, is moderate.

b) The opinion about ‘overall teamwork’ in the higher secondary school education in Kerala is the same among government, aided and unaided school teachers. Therefore, the hypothesis that the opinion of the teachers with regard to the extent of overall teamwork, as part of application of TQM in higher secondary school education in Kerala, is the same, irrespective of, the type of ownership, is accepted.

c) However, according to the rural teachers there is more ‘overall teamwork’ as indicated by the p value (0.003). Therefore, the hypothesis that the opinion of the teachers, with regard to overall teamwork as part of application of TQM in higher secondary school education in Kerala, is the same, irrespective of, the location of schools, is rejected.

d) The teachers of different subjects may be having difference of opinion on teamwork, because ‘clusters’ or teams are formed based on subjects. It is interesting to note that although teachers cluster together based on the subject, every cluster group, irrespective of the subject they represent, have the same opinion with regard to ‘overall teamwork’, as indicated by the p value 0.422. Therefore, the hypothesis that ‘the opinion of the teachers with regard to overall teamwork achieved among teachers as part of application of TQM in higher secondary school education in Kerala, is the same, irrespective of, the subject taught’, is accepted.

2. Customer Satisfaction

In this section the satisfaction of higher secondary school teachers on ‘infrastructure’ and service aspects like ‘compensation’, ‘work load’, ‘attitude
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of management’ etc and satisfaction of students and parents on ‘infrastructure’, ‘teachers and their attitude’, ‘conduct of examination’ and ‘other supporting system’ have been assessed. The major findings on satisfaction of teachers, students and parents are summarized below under three heads.

Satisfaction of Teachers

a) The ‘overall satisfaction’ of teachers is assessed and found to be above moderate. $Z$ value (11.771), corresponding to overall satisfaction of teachers, is significant and the mean (3.33) is considered to be greater than the central value (3) of the scale of measurement. Therefore, the hypothesis, ‘the overall satisfaction of teachers achieved as part of application of TQM in higher secondary school education in Kerala is moderate’, is rejected.

b) In the case of ‘overall satisfaction’, it is found that the teachers of aided schools (mean 336.82) are more satisfied than government school teachers (mean 294.48) and unaided school teachers (mean 306.45), and the difference in the satisfaction level is highly significant, as indicated by the $p$ value which is less than 0.001. There is no significant difference between unaided and government school teachers in overall satisfaction. Therefore, the hypothesis, ‘the extent of overall satisfaction of teachers in higher secondary school education in Kerala is the same, irrespective of the type of ownership’, is rejected.

c) Further probing into the differences between aided and unaided school teachers, in the level of satisfaction, it is found that the unaided school teachers are lesser satisfied than the aided school
teachers, on aspects like, compensation, career growth, workload, attitude of management, attitude of principal, and relationship with co-workers. When unaided school teachers are compared with aided school teachers in matters of satisfaction on infrastructural facilities, the aided and the unaided school teachers had the same level of satisfaction with respect to most of the infrastructural facilities. Therefore, it can be understood that, the unaided school teachers are lesser satisfied about the service aspects of their job like compensation and attitude of management than with the infrastructural facilities.

d) Difference in satisfaction level could be seen between aided and government school teachers in the case of attitude of parents, attitude of management and workload, in these cases the aided school teachers are significantly more satisfied. With respect to the infrastructural facilities the government school teachers are significantly less satisfied than the aided school teachers regarding, class rooms, library, toilets, auditorium, computer lab, science lab, common area, other general facilities, technological aids and staff room. Thus, the government school teachers show lesser satisfaction on all infrastructural facilities than aided school teachers and the differences in satisfaction is significantly high. It should thus be understood that the reason for the government school teachers to have lesser ‘overall satisfaction’ than the aided school teachers lies in the inadequacies of infrastructure rather than service related matters.

e) It is also found that, there is no difference in the level of overall satisfaction between urban and rural school teachers (p value 0.129). Therefore, the hypothesis that, ‘the overall satisfaction of
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teachers in higher secondary school education in Kerala is the same, irrespective of the location of the schools, can be accepted.

Satisfaction of Teachers on Infrastructure

The satisfaction on infrastructure comprising of class room, library, toilets, auditorium, computer lab, science lab, common area, and other general facilities (electricity and water availability, canteen etc), technological aids and staffroom is assessed in this study.

a) The study reveals that, there is significant difference in the satisfaction among teachers of government, aided and unaided schools with regard to each and every element of infrastructure and that too, except in the case of facilities of science lab, the differences happen to be highly significant. In the case of all the elements of infrastructure except technological aids, the aided and unaided school teachers are equally satisfied, and their satisfaction is significantly higher than the government school teachers.

b) The study found that, in the case of overall satisfaction on infrastructure the aided (mean 171.91) and unaided (mean 167.63) school teachers have more satisfaction than the government (mean 137.27) school teachers and the difference in satisfaction level is highly significant, p value being less than 0.001. The overall satisfaction in infrastructure is the same for male and female teachers, urban and rural school teachers and teachers teaching different subjects. However, it is noted that the middle age group of teachers (mean 150.12) have lesser overall satisfaction in infrastructure than the younger (mean 167.35) and elder school (mean 164.96) teachers, as indicated by the p value 0.002.
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Satisfaction of the Students

Students are the primary customers of school education and the sole existence and pride of the schools is, in enhancing their satisfaction. The ultimate aim of total quality management is satisfaction of the customer and each and every effort of the total quality culture is directed towards reaching this goal. This study has assessed the satisfaction of the students on different variables like ‘infrastructure’, ‘teachers and their attitude’ and ‘conduct of examinations’. The ‘overall satisfaction’ comprises of the aggregate of these three variables.

a) The study found that the overall satisfaction of the students is above moderate. The Z value, 19.476 is found to be significant at 0.01 levels of significance.

b) The study found that, the satisfaction level of aided (mean 171.38) and unaided (mean 171.55) school students is significantly higher than that of students of government schools (mean 158.26) with respect to ‘overall satisfaction on infrastructure’ (p value less than 0.001).

c) It is interesting to note that, the satisfaction of the students of government, aided and unaided schools is the same on, ‘teachers and their attitude’ and also on the ‘conduct of examinations’.

d) In the case of ‘overall satisfaction’, the students of aided schools (mean 254.62) are more satisfied than government school students (mean 240.20). The point to be noted here is that the reason for the differences in satisfaction is not due to the differences in the satisfaction level about ‘teachers and their attitude’ or ‘conduct of examinations’ but only on the inadequacy of infrastructure.
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e) The study found differences in ‘overall satisfaction’ between urban (mean 254.66) and rural (mean 240.67) school students, where urban students are more satisfied, as indicated by the p value 0.001. Here also, both these type of students have the same level of satisfaction on ‘teachers and their attitude’ (p value 0.448) and ‘conduct of examination’ (p value 0.131). However, with respect to most of the infrastructural facilities and in the case of ‘overall satisfaction in infrastructure’, the satisfaction of urban school students (mean 172.06) is significantly higher than rural school students (mean 159.40), p value less than 0.001.

f) The overall satisfaction on infrastructure is significantly lesser for students in co-educational schools (mean 159.06) than the students in boys only schools (mean 172.80) and students in girls only schools (mean 175.19), p value being less than 0.001.

g) In the case of class room, the students of boys only schools and girls only schools are having same level of satisfaction but they are more satisfied than co-educational school students, the p value (0.001) is highly significant. Most of the classrooms built for high schools were converted to plus two classes, therefore the size of the class rooms are observed to be inadequate for the plus two students.

h) In the matter of toilets, the students of girls only schools (mean 29.73) are more satisfied than boys only schools (mean 23.63) and co-educational schools (mean 24.19) and the differences in the level of satisfaction is highly significant. This is because, the toilet facilities for the girls students are given much importance by the government and funds were allocated for this purpose and has been channelized to the
44 girls only schools in the state and also to a number of selected co-educational schools (Government of Kerala, 2011).

i) It is also important to note that the students of boys only schools (mean 66.28) are lesser satisfied than girls only (mean 71.13) and co-educational schools (mean 70.35) in the matter of ‘teachers and their attitude’ (p value 0.039).

j) The overall satisfaction of the students of co-educational schools (mean 241.36) is lower than that of students of girls only schools (mean 258.27) (p value 0.001) and what bother the students of co-educational schools are not the ‘teachers and their attitude’ or ‘conduct of examination’ but in the adequate provisioning of infrastructure.

k) The satisfaction of students may differ on the basis of the subject combination taken for study. Accordingly, the students are classified as Science, Humanities and Commerce groups. The satisfaction level of students of all streams is the same with regard to ‘infrastructure’, ‘teachers and their attitude’, and ‘conduct of examination’ and also with regard to ‘overall satisfaction’. In all these cases, the p value is not significant.

Satisfaction of Parents

An important principle of TQM is attaining satisfaction of both internal and external customers and an important external customer is the ‘parent’. In this study the satisfaction of parents of the students of higher secondary schools are assessed using different variables like ‘infrastructure’, ‘teachers and their attitude’, ‘attitude of the principal’ and ‘other supporting system’, which comprises of aspects like conduct of parent-teacher meetings, teacher-
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student ratio, number of working days in a year, permanency of faculty, selection of teachers, counseling for students and parents, career guidance, academic achievement of the school, and importance given to co-curricular and co-academic activities.

a) The satisfaction level of parents of government school students and unaided school students are the same on ‘teachers and their attitude’, ‘attitude of the principal’ and ‘other supporting system’, because in all these cases the F value is found to be not significant. Thus, it is interesting to point out here that the difference in the satisfaction level of parents of government school students is not due to inadequacies of satisfaction in ‘teachers and their attitude’, ‘attitude of principal’ and ‘other supporting system’ but on a more rectifiable factor, ‘the infrastructure’.

b) The parents in girls only schools are more satisfied than boys only schools and co-educational schools with respect to ‘teachers and their attitude’, ‘attitude of the principal’, ‘other supporting system’, and ‘infrastructure’ and also in the case of ‘overall satisfaction’. In all these cases, the difference in satisfaction level is significantly high, as p value is less than 0.001. The parents of students studying in boys only schools are least satisfied on ‘teachers and their attitude’ (p value less than 0.001).

c) The study found that the overall satisfaction of parents of students of the higher secondary schools in Kerala is above moderate. The Z value, 4.276 is found to be significant at 0.01 levels of significance.
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Problems in the Implementation of TQM

The government of Kerala has been undertaking concerted efforts in the quality improvement of education from the primary level to the higher education level. Quality improvement supported by the philosophy of TQM has envisaged major changes in the curriculum through learner centered teaching methodology and faculty development through teacher education and training. The programmes designed to improve quality of education ultimately persuades the teachers to shoulder the responsibility of implementation. Therefore this study attempts to identify the problems faced by the teachers in the implementation of such quality initiatives.

In order to analyze the collected data and to identify the dimensions of the problems faced by the teachers in the implementation of TQM, factor analysis on the thirty six statements is performed, which has statistically helped to reduce the problems to a significant set of ten factors. The study found that 63.44 per cent of the total variance in the problem is explained by these ten factors. The factors identified are, ‘Socio-Economic problem’, ‘Implementation problem’, ‘Vast syllabus’, ‘Problem of Terminal Evaluation’, ‘Problem of continuous internal evaluation’, ‘Problems related to lesson planning’, ‘Problem of working hours’, ‘Problem of remedial teaching’, ‘Problem of clusters’ and ‘Influence of Association’.

a) The least problematic, out of the ten factors, is ‘influence of association’ in the teachers’ work related matters (percentage score 58.3) and ‘problems related to lesson planning’ (percentage score 58.9). But, the most problematic among them are of ‘vast syllabus’ (77.1), ‘remedial teaching’ (77) and ‘continuous internal evaluation’ (79.1).
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b) The study found that, there is significant difference in the severity of problem faced by the teachers of government, aided and unaided schools in the case of the factors – ‘socio economic problem’, ‘continuous evaluation’ and ‘remedial teaching’. The ‘socio-economic problem’ is more severe in the government schools (mean 22.75) than in the aided schools (mean 20.66) but it is the least in the unaided schools (mean 16.87), (p value less than 0.001).

c) Remedial teaching is more problematic for government (mean 11.88) and unaided school teachers (mean 12.13) than to the aided school teachers (mean 10.83), p value 0.043.

d) The problem of continuous internal evaluation (percentage score 79.1), is the same for aided and government school teachers but, higher for unaided school teachers.

e) Both male and female teachers agree on the existence of majority of the problems identified through factor analysis. The opinion of male and female teachers are the same regarding socio-economic problem (p value 0.291), problem of implementation (p value 0.97), vast syllabus (p value 0.10), continuous internal evaluation (p value 0.333), remedial teaching (p value 0.150), clusters (p value 0.980) and influence of associations (p value 0.870).

f) According to the male teachers, the problem of terminal evaluation is more severe than thought by the female teachers (p value 0.045). But the problems related to lesson planning and problem of working hours is more for the female teachers than for the male teachers (p value 0.004).
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g) The study further analysed, whether, there is any relation between the age of the teachers and the factors. The opinion on the extent of problems felt among teachers of various age groups are the same, with respect to, socio-economic problem, implementation problem, problems of vast syllabus, terminal evaluation, continuous internal evaluation, lesson planning, working hours and remedial teaching. However, the problem of clusters is more felt by the elder teachers than the younger and the middle age teachers (p value 0.017).

h) Most of the problems faced by the teachers may be attributed to the subject taught by the teacher. Some of the subjects taught in higher secondary schools like languages are frequently changed and some are so vast to be efficiently covered within a year. Therefore, depending upon the subject handled, the difficulties of implementation also vary. It is found that the problem of vast syllabus is very high for Science, Humanities and Commerce teachers than for the Language teachers.

i) The problem of ‘continuous internal evaluation’ is more for Commerce teachers than for Language teachers. Science and Commerce teachers have more problem than the Language teachers with respect to ‘problem of working hours’.

Suggestions

The core concept of total quality management stresses on the importance of constantly striving to attain higher levels of improvement and satisfaction. Thus, the extent of continuous improvement achieved in teaching, teachers, evaluation and infrastructure and the levels of satisfaction of the teachers, students and parents attained, should not be considered as the
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ultimatum, but the education system on the whole, should strive for new heights insatiably. The study has assessed continuous improvement, teamwork and customer satisfaction in the higher secondary school education in Kerala and has also focused on the problems faced in the implementation of TQM and therefore, has been able to highlight the key areas where concerted efforts could be taken to improve the TQM process. Based on the study the following suggestions are proposed as suitable remedies for attaining higher levels of improvement in the teaching learning process, teamwork and customer satisfaction.

1. Even though continuous improvement in teaching, teachers and evaluation are the same in government, aided and unaided schools, the continuous improvement in infrastructure in the government schools is way behind. Therefore, infrastructural facilities covering, adequately sized classrooms, library, toilets, auditorium, computer labs, technological aids and staffroom, in the government higher secondary schools have to be addressed to, immediately.

2. Most of the problems in the implementation of TQM are associated with the ‘problem of vast syllabus’ especially in the case of Science, Humanities and Commerce subjects. The syllabus being vast, the teachers, especially, Science teachers, find it difficult in conducting the continuous and comprehensive internal evaluation. Failing to conduct internal evaluation effectively would undermine the quality of education. Therefore, efforts should be taken by the authorities to redesign and reduce the syllabus, suitably.

3. Higher the extent of teamwork, higher is the effectiveness of the ‘school resource groups’ and ‘clusters’ of teachers. It is found that the
teamwork achieved in the higher secondary school education is moderate. The assessment of the problem of clusters also shows a percentage score of 72.8, which indicate that teamwork through clusters, are not devoid of inefficiencies. The teachers feel that the clusters are not productive; and that school working days are adversely affected due to cluster meetings and they do not participate actively in clusters (Table 7.4, Rotated Component Matrix). Therefore, efforts should be taken to improve the teamwork in the clusters and school resource groups. For this purpose the opinion of the teachers should be obtained, through a feed back mechanism, so that, improvements could be made in the future sessions of clusters. The clusters can also be made more productive by engaging expert resource persons from outside, instead of engaging trained teachers of higher secondary schools, since, psychologically, resource persons from outside are more acceptable than fellow-teachers. Training provided in the ‘clusters’ should also be placed in the hands of experts in the field of teaching methodology and management. This would enable the teachers to efficiently implement the changes in the teaching methodology, application of total quality efforts in classrooms and to have better understanding of the philosophy of TQM in education. Teachers should also be provided training and education to refresh their knowledge in their respective subject, in the use of hi-tech teaching aids, and also to deal effectively with adolescent children. The presence of officials from the department is desirable in all clusters, at least in the initial period, or until the teams become self reliant.
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4. The satisfaction of the higher secondary school teachers is above moderate. However, with regard to certain key areas, there is comparatively lesser satisfaction. One such area is the satisfaction on workload which is assessed to reflect a percentage score of 61.2, which is lower when compared to the percentage scores on other aspects like attitude of parents, attitude of students, compensation, attitude of management and principal and relationship with co-workers. Therefore, efforts should be taken to improve the satisfaction of the teachers on workload by reducing the number of working days per week, as the higher secondary school teachers work for six days a week. This will also help to safeguard and keep up the physical and mental health of teachers as well as students. Adequate supporting staff should be appointed in higher secondary schools and the teachers should be left to concentrate on classroom activities instead of office jobs which increase their workload.

5. The problem of ‘continuous internal evaluation’ is at a percentage score of 79.1 and is the most pertinent problem of the teachers. High teacher-student ratio is one of the factors contributing to this problem (Table 7.4, Rotated Component Matrix). An effective learner centered, activity oriented, teaching methodology is incompatible with high teacher-student ratio. Therefore, the teacher-student ratio should be reduced.

6. The continuous and comprehensive internal evaluation, if not done scientifically, will place no significant difference between students who excel and students who do not and would destroy the whole purpose of the education system. The philosophy of TQM emphasizes on, the need to be self critical and to involve whole heartedly, so that,
there is no need for coercion and control from outside. Therefore, the
teachers should take sincere efforts to conduct ‘continuous internal
evaluation process’ as envisaged and inspection of the irregularities in
internal evaluation conducted periodically should be dropped from
the system in the long run.

7. The socio-economic problem which denotes health problems of
parents, alcoholism, use of narcotic drugs by students etc could be
solved by providing counseling to both parents and students. The
existing system of providing counseling should be made more
effective by starting counseling centres in every school. For ensuring
privacy to the students seeking help, separate room should also be
provided for the purpose of giving counseling.

8. The ‘implementation problem’ identified through factor analysis is at
69.3 per cent. Implementation problem comprises of the problems like,
lack of interest of the students, inability of the students in doing their
assignments on their own etc (Table 7.4, Rotated Component Matrix).
Most of the students do not participate actively in such learner centered
classrooms, mainly because; they do not know how to involve.
Orientation programmes should be given to students by the teachers, for
reaping the benefits of student-centered learning. This will enlighten the
students about the role they have to play in activity oriented learning and
thus enable them to involve more effectively in an activity oriented
classroom. In order to improve, on the basic entry quality, classes for
updating the basics, in the form of bridge courses should also be given
for the students in the beginning of the academic year. The government
can also set apart fund for remedial teaching, for the purpose of
Summary of Findings, Suggestions and Conclusions

providing additional remuneration to the teachers, who engage extra hours for remedial teaching.

9. Quality takes birth is the classrooms; therefore, importance should be given to ensure that TQM is properly applied in the classrooms. The educational authorities, like SCERT, have brought out ‘Teacher’s Source book’ containing models of lessons, prepared by experts. The teachers should be encouraged to make intensive use of the teacher’s source book. The source book should be revised and updated.

10. The problem of terminal evaluation is at a percentage score of 68.5. It comprises of, issues about, proper valuation of answer papers and also on the setting of proper question papers. Over importance is given to application level questions in the terminal evaluation and in the case of Language subjects, questions based on the text books are not included, which has in a way adversely affected the basic communication skills of students. Thus, for languages, the traditional system of learning text books should only be supported and not replaced with activity oriented learning.

11. The concepts and application techniques of TQM must be included in the syllabus of B.Ed. programme, a mandatory programme, to become teachers, - ‘to catch them young’. This would help in instilling into the teachers the philosophy of total quality management in education.

12. In order to ensure the quality standards, a new hierarchical network of quality managers or facilitators having management qualifications should be appointed at school, district and state level, as vehemently suggested by the Kerala State School Education Commission 2003-04.
Conclusion

The examination of the TQM initiative in higher secondary school education in Kerala could reveal a number of pertinent information about the process of implementation, current scenario of the initiative and the flaws in its implementation process. The results of the study reporting ‘above moderate level’ of continuous improvement in teaching, teachers, evaluation and infrastructure by ensuring above moderate satisfaction level of teachers, students and parents, about the process, are strong indicators of the efficient implementation of TQM, in higher secondary school education in Kerala. Continuously improving quality of education, based on, vision and revisited mission, to attain and cope-up with changing standards of education world around, are inevitable. Benefits of total quality management could be reaped by efficient implementation of the periodically updated, quality initiatives through the process of effective team work. This would enable the higher secondary school education in Kerala; reap exponential benefits in the long run. By the constant and continuous implementation of the TQM measures, the higher secondary school education in Kerala through government, aided and unaided schools, could reach the heights of national and international standards.

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