Chapter-III

RESEARCH METHODOLOGY
3.1 Introduction

Human resource management is the practice to engage human potential to achieve total quality management. The HRM role is to utilize the resources of organization in an efficient manner. There is a need to shift from traditional way of human resource management practices towards strategic human resource management practices within technical (Engineering) educational institutions. In the study, we define Total Quality Management as a continuous process of implementing quality measures with strategic human resource management practices to achieve the vision of the institution. This study covers the effective use of HRM practices and TQM process in technical educational institutions (Engineering Institutes) under Swami Ramanand Teerth University, Nanded Jurisdiction.

3.2 Research Statement

It is stated earlier that the private technical institutions grow in quantity rather than quality in India. The intention of the government behind permitting the private stakeholders to open the institutions is to motivate the technical education in India and to create the skilled workforce as per country’s
requirement, which will contribute to the development of the nation. It is observed, in last few years, that 50% seats of the total intake capacity are remaining vacant in private engineering colleges in Maharashtra. And the students those who are pass out remain unemployed and on the other side the industry is facing a huge shortage of skilled workforce, which seems to be rather contradictory.

There is a skill mismatch between industrial requirement and the skill delivered by institutions through the curriculum. Despite having high number of technocrats from the region, human developmental index of the region is less. Quality parameters of these technocrats and the technical institutions must be monitored.

"Parameters should be set to improve the quality of students and the faculty of the sector. Institutions in the rural, backward and underprivileged areas should be given more focus since they may not be able to cater to all stringent requirements demanded by AICTE,"(Pallam Raju, 2013).

Every year approximately 1,60,000 students pass out from technical institutes in Maharashtra. There are 365 engineering- degree and diploma colleges, 616 industrial training institutes, and more than 24 universities in Maharashtra (AICTE). There is a huge potential in Maharashtra to produce high quality technocrats. Marathwada region is one of the least developed regions in Maharashtra. Latur district from Marathwada region is considered as an educational hub in Maharashtra after Pune. Technical institutes have gradually increased in Latur and its nearby districts (Nanded, Parbhani and Hingoli). The main objective of technical institutes is to provide the quality education by producing good technocrats but they are lagging behind in fulfilling their objectives

In the year 2014-2015, there were total eleven technical (Engineering) institutes in four districts (Latur, Nanded, Parbhani and Hingoli) which come under SRTM University, Nanded Jurisdiction. Though the number of
technocrats from the region is high, human developmental index is found less for this region. It needs to monitor the quality of these technocrats.

There is a need to assess the HRM and TQM practices in these technical educational institutions to understand quality related issues. Mostly Indian technical institutions follow the traditional way of human resource management practices which is not sufficient to manage the institutions effectively and efficiently which affects the entire education system of India. Quality of any system is possible only by striking an optimal balance among various competing demands of any system.

The present study about the “TQM and HRM practices in technical education institutions” is an attempt to understand why the unemployment ratio among engineering graduates is high, though there is a huge requirement of skilled workforce in the industry. It also addresses the following pertinent questions.

- What are the barriers that restrict institutions from implementing the human resource management practices in an effective manner?
- Which factors influence the TQM process in technical educational institutions?
- Is there any difference in the way of implementing the HRM and TQM practices in various institutions?
- What are the faculty and student perception towards implementation of HRM and TQM practices within their institutions.

3.3 Research Questions

In order to explore the subject in depth, following research questions have been formulated based on the above objectives:-

- What are the barriers that restrict institutions from implementing the human resource management practices in an effective manner in
technical institutions within SRTM University, Nanded jurisdiction?

- Which are the factors that influence the TQM process in technical institutions within SRTM University, Nanded jurisdiction?

- What are the differences existing in the way of implementing the HRM and TQM practices in different technical institutions within SRTM University, Nanded jurisdiction?

- What are the faculty and student perceptions towards implementation of HRM and TQM practices in technical institutions within SRTM University, Nanded jurisdiction?

3.4 Objectives of the Study

The primary objective of this research is to explore the effective implementation of TQM and HRM practices in Technical (Engineering) Educational institutions which come under the SRTM University, Nanded Jurisdiction. The present study has been conducted with following secondary objectives.

- To assess HRM practices implemented in technical institutions within SRTM University, Nanded jurisdiction as per students and as per faculty perception.

- To study the perception of prime stakeholders (Faculty and Students) about the principles of Total Quality Management process followed in technical institutions.

- To study the difference between perceptions of Faculty and Students of different institutions with respect to TQM.

3.5 Hypothesis of Study:

- \( H_0 \): HRM practices are not implemented to great extent within the institutions.
• H₁: HRM practices are implemented to great extent within the institutions.

• H₀: There is no significant difference in perception between faculty and the students about the principles of TQM.

• H₁: There is a significant difference in perception between faculty and the students about the principles of TQM.

• H₀: There is no significant difference among different institutions in perception about the principles of TQM.

• H₁: There is a significant difference among different institutions in perception about the principles of TQM.

3.6 Research Methodology

This section describes the research design, sample design, data collection and data analysis.

Research Design

The study uses survey based research method and is structured with clearly stated hypothesis and investigative questions. It is exploratory and descriptive in nature because it attempts to answer what and why questions raised through literature review and describes the current situation of technical education system in regional (Technical (Engineering) Educational Institutions in SRTMU, Nanded Jurisdiction) context. It measures the significance of HRM practices that are implemented to a great extent within the technical institutions, perception between faculty and the students about the principles of TQM, perception about the principles of TQM among different technical institutions.

In order to study the concept in depth a survey based research approach is adopted. The study has been conducted in total 11 Engineering institutions (Selected Technical Educational institutions) which come under the jurisdiction
of Swami Ramanand Teerth Marathwada (SRTM) University, Nanded. Thus the research design adopted for the study is **cross sectional descriptive study**; the research instrument used was a structured questionnaire. The most important characteristics of descriptive cross sectional design is that it describes and explores the characteristics of the individual /groups included in the study. This research design is adopted because of following reasons.

1. To describe the characteristics of individual or group included in the study. The study has focused on understanding the perception and visualization of prime stakeholders (Student and Faculty) of the technical educational institutions in SRTM University, Nanded Jurisdiction.

2. To understand the personal factors like gender, age, qualification, experience, personality background, and skill.

3. To determine the importance of HRM practices in technical educational institutions in the faculty perception. The factors includes academic process, workplaces values and environment, teaching and learning, research, workload, performance appraisal and facilities.

4. To determine the importance of HRM Practices in technical educational institutions in student perception. The factors includes counselling, studying arrangement, studying, self-assessment, attitude, learning, practical training and teaching.

5. To identify the total quality management factors in faculty and student perception. The factor includes leadership, strategic planning, external focus, information and analysis, staff/student workplaces, process effectiveness, outcome and achievement.

6. As educational policies are subject to change so cross sectional study is taken under consideration.
7. Cross sectional studies can be thought as a snapshot of the frequency and characteristics of a condition in a population at a particular point of time.

8. Cross sectional study is the one whose primary goal is to assess a sample at a specific point of time for further defined population.

9. The cross sectional study is used
   1. To identify areas for further research
   2. To help in planning resource allocation
   3. To provide informal information

To explore the chosen subject in depth, mixed method approach has been adopted for the research study. Under this approach both quantitative and qualitative research methods were accepted to analyze the selected research topic. As the number of private technical (Engineering) institutions has grown substantially in quantity rather than quality in last few years, quantitative analysis permits a systematic and rigorous investigation of the possible connection between various factors which are affecting the quality of technical education. At the same time qualitative analysis exposes the current situation of technical education in India. This necessary information assists in the formation of several hypotheses and the selection of variables in statistical model.

The study follows the sequential process by conducting structured questionnaire followed by a pilot study to test the reliability of questionnaire by taking the survey of 10% samples (Faculty 21 and Students 37) from total sample size, and survey method to generalize the finding to the large population.
Sample Design

Types of Sampling

Both probability and non-probability sampling methods are used for the study. Under probability sampling method, simple random sampling method is used. This method is suitable for selecting the engineering educational institutions from the selected technical educational institutions in SRTM, University, Nanded Jurisdiction (Latur, Nanded, Parbhani and Hingoli) which are clearly identified without any difficulty. Opinions of the prime stakeholders (students and faculty) are collected from private and autonomous institutions. Convenience sampling method is used. This method attempts to obtain a sample of convenient prime stakeholders (Students and Faculty) who are ready to give information.

Sample Size

Faculty population of around 587 is considered as per the information disclosed by technical (Engineering) educational institutions on their respective websites (as per AICTE guidelines for information disclosures). Around 4241 final year student population is considered as per the intake of course disclosed on Directorate of Technical Education (DTE), Maharashtra website (www.dtemaharashtra.gov.in). From the considered population of faculties and student, around 200 faculties and 350 students sample size is calculated based on the sample size formula suggested on www.surveystem.com website. The sample for faculty in this study consists of Lecturers, Professors, Junior Lecturers and sample for students in this study consists of final year students.
Table 25

Stratified Simple Random Sampling for Faculty and Student from 11 Technical (Engineering) institutions from SRTM, University, Nanded Jurisdiction

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>District</th>
<th>No of Faculty</th>
<th>No. of student</th>
<th>Number of Faculty and Student</th>
<th>Sample size for Faculty</th>
<th>Sample size for Student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>District wise %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Nanded</td>
<td>319</td>
<td>1802</td>
<td>319 (54%) 1802 (42%)</td>
<td>108 (54%)</td>
<td>147 (42%)</td>
</tr>
<tr>
<td>2</td>
<td>Latur</td>
<td>219</td>
<td>1752</td>
<td>219 (37%) 1752 (41%)</td>
<td>74 (37%)</td>
<td>144 (41%)</td>
</tr>
<tr>
<td>3</td>
<td>Hingoli</td>
<td>24</td>
<td>347</td>
<td>24 (4%) 347 (9%)</td>
<td>08 (4%)</td>
<td>31 (9)</td>
</tr>
<tr>
<td>4</td>
<td>Parbhani</td>
<td>25</td>
<td>340</td>
<td>25 (5%) 340 (8%)</td>
<td>10 (5%)</td>
<td>28 (8%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>587</td>
<td>4241</td>
<td>200 (100%) 350 (100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: www.srtmun.ac.in
Figure-26

Sample Distribution for Faculty

Source: www.srtmun.ac.in

Figure-27

Sample Distribution for Student

Source: (DTE)
Table 26

Total Number of Samples Responded

<table>
<thead>
<tr>
<th>Sample Category</th>
<th>Sample Selected</th>
<th>Sample Responded</th>
<th>Sample Responded in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>210</td>
<td>200</td>
<td>95 %</td>
</tr>
<tr>
<td>Student</td>
<td>360</td>
<td>350</td>
<td>97 %</td>
</tr>
<tr>
<td>Total Samples</td>
<td>570</td>
<td>550</td>
<td>96 %</td>
</tr>
</tbody>
</table>

Figure-28

Sample Distribution for Total Respondent

Table 27

Sample Size Formula

Sample size formula is:

\[ n = \frac{z^2 \cdot p \cdot q \cdot 1 + MB^2}{MB^2 + \frac{z^2 \cdot p \cdot q}{N}} \]

Source: www.surveysystem.com
Where,
\[ Z = \text{value (e.g. 1.96 for 95% confidence level)} \]
\[ p, q = \text{percentage picking a choice, expressed as decimal} \]
\[ (.5 \text{ used for sample size needed}) \]
\[ ME = \text{Margin of error which is always plus or minus 4% or 0.04} \]
\[ N = \text{No of samples for student or faculty} \]

Table 28

**Illustration of Sample Size for Faculty**

<table>
<thead>
<tr>
<th>( Z^2 )</th>
<th>1.96</th>
<th>0.49</th>
</tr>
</thead>
<tbody>
<tr>
<td>( p )</td>
<td>0.5</td>
<td>Above</td>
</tr>
<tr>
<td>( q )</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>( ME^2 )</td>
<td>0.0016</td>
<td></td>
</tr>
<tr>
<td>( N )</td>
<td>547</td>
<td></td>
</tr>
</tbody>
</table>

\[ n \text{ for Faculty} = \frac{196+0.5+0.5+0.0016}{0.0016+0.000896} \approx 200 \]

Where \( Z^2 = 1.96 \)
\[ p=0.5 \]
\[ q=0.5 \]
\[ N \text{ for Faculty}=587 \]
\[ ME \text{ is Margin of error which is always plus or minus 4% or 0.04} \]
Table 29

Illustration of Sample Size for Student

<table>
<thead>
<tr>
<th>$Z^2$</th>
<th>1.96</th>
<th>0.49</th>
</tr>
</thead>
<tbody>
<tr>
<td>$p$</td>
<td>0.5</td>
<td>Above 0.4916</td>
</tr>
<tr>
<td>$q$</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>ME$^2$</td>
<td>0.0016</td>
<td>0.49</td>
</tr>
<tr>
<td>$N$</td>
<td>4241</td>
<td>0.000116</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below 0.001716</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$n$ for Student</td>
<td>286.5572</td>
<td></td>
</tr>
</tbody>
</table>

Where $Z^2 = 1.96$

$p = 0.5$
$q = 0.5$

$N$ for student = 4214

ME is Margin of Error which is always plus or minus 4% or 0.04

$ME^2 = 0.0016$

Sample size for Student ($n$) = $\frac{1.96 \times 0.5 \times 0.5 + 0.0016}{0.0016 + \frac{0.0016}{4241}}$

Sample size for Student ($n$) = $\approx 350$
Universe of the study

The target population for the research is the prime stakeholders (Faculty and Students) of the technical (Engineering) educational institutions under SRTM University, Nanded Jurisdiction (Latur, Nanded, Parbhani and Hingoli).

Sampling Frame

The details regarding the technical educational institutions that come under SRTM University, Nanded Jurisdiction is listed on the websites of Swami Ramanand Teerth Marathwada University (SRTMU) and Directorate of technical Education (DTE) in the year 2015-2016. The list consists of eleven engineering colleges (private and autonomous) with the intake of 4241 students for the academic year 2015-2016 and faculty 587 approximately as per the information disclosed by institutions on their college website.

The unit of observation

The sample unit for the study is faculty (lecturers, professors and junior lecturers) and final year students from technical (Engineering) educational institutions (under graduate and post graduate).

Sample Selection

The population of the study includes the opinions of the faculty and students. The sample size decided was 550 (Faculty 200 and Student 350). For the collection of the samples, multi-stage sampling method was adopted. In the first stage 11 engineering institutions were identified from the list of technical education institutions which come under SRTM University, Nanded Jurisdiction. In second stage stratified random sampling was adopted to select prime stakeholders (Faculty and Student) from 11 engineering institutions which come under SRTM University, Nanded Jurisdiction. The strata is based on the districts that comes under SRTM University, Nanded Jurisdiction from each stratum, faculty and students are selected using convenience sampling
method. Convenience sampling method is adopted as it attempts to obtain the sample of the faculty and the students who are ready to give information.

Firstly, the known source faculty was identified using personal network and from the institutional website. Secondly, on the basis of convenience and accessibility of the sample elements the information was collected from faculty (Lecturers, Professors, and Junior Lecturers) belonging to the technical (Engineering) institutions which come under SRTM University, Nanded Jurisdiction. Total 210 faculty were approached however only 200 agreed to participate in the survey.

For the student sample, final year students of engineering and technology courses were selected, on the basis of the intake (4241) population considered from the 11 engineering colleges which comes under SRTM, University Nanded Jurisdiction. Total 360 students were approached however only 350 agreed to participate in the survey.

Research Area

Figure -29

Swami Ramanad Teerth Marathwada University Nanded, Jurisdiction

Source: http://www.srtmun.ac.in/en/about-srtmun/about-srtmun.html
The study has been carried out in eleven engineering institutions from four districts Latur, Nanded, Hingoli and Parbhani which comes under Swami Ramanand Teerth Marathwada University, Nanded Jurisdiction.

**Data Collection Method**

The data collected for this research is both primary as well as secondary. Tools like interview, observation, questionnaires are used for collecting primary data. The primary data is collected from sample survey of 550 respondents which includes faculty and students from the technical (Engineering) educational institutions under SRTM University, Nanded Jurisdiction. The secondary data is collected from previous research, official statistics, government reports, web information, historical data, journals, books, periodicals and from other relevant material. To get deeper understanding of phenomenon, a semi structured questionnaire is used which divided into two sections. The first section is dedicated to HRM practices perspective and second section covered information related to total quality management perspective. These questionnaires are circulated through personal visits. Total 210 questionnaires are circulated among the faculty, out of which 200 responded and 360 questionnaires are circulated among the students, out of that 350 students responded.

**Research Problem Addresses to –**

- Assess HRM practices implemented in technical institutions within SRTM University, Nanded jurisdiction as per students and as per faculty perception (prime stakeholders).

- Study the perception of prime stakeholders (staff and students) about the principles of Total Quality Management practices employed in technical institutions.

- Study the difference between perceptions of staff and students of different institutions with respect to TQM.
3.6 Summary

This chapter focuses the entire research design and methodology adopted for the research. In order to analyze the research problem certain objectives and research questions were framed with stated hypotheses. In order to test the hypothesis, structured questionnaires were designed to check the perception of prime stakeholders (faculty and students) of the selected institutions.