Chapter 4: Research Methodology

Introduction
This research is based on scientific method which has empirical verification as objective. The scientific method used has predictability and system as main characteristics, where results are predicted with sufficient accuracy by using designed procedures / system for systematic mode of investigation. The method of investigation is based on logical aspect because inferences drawn are on the basis of collected data. The data collected was through experimental observation.

4.1 Basis for Research Methodology:
4.1.1 An Overview
The researcher, with 30 years of teaching experience, is working with an engineering institution, which is 30 years old, in the State of Maharashtra. Vishwakarma Institute of Technology, Pune (VIT,Pune) was established in 1983 by Bansilal Ramnath Agarwal Charitable Trust with 3 branches at UG level. Further the branches were expanded with 9 UG, 8 PG along with recognized PhD center for 6 disciplines as on date. The institute has received academic autonomy in 2008 by following rigorous process for autonomy. It is a first private, self financed technical institute who has received the academic autonomy in the state of Maharashtra. Students from Maharashtra as well as many other states in the country have studied engineering in VIT and nearly 400+ international students study in this Institute.
Thus VIT, Pune has established its brand value in Technical Education in India as well as abroad. The core competency of the institute is implementation of teaching learning process and dedicated faculty available. Therefore it is a tradition that meritorious students take admissions every year and no vacancy (at the time of admission) is recorded at any level (UG/PG) during the single window admission process in each year. The effect of this is seen at the time of campus placement as well as at the time of admissions for higher education abroad. It was possible mainly because of the qualified, dedicated good teachers with appreciable retention period of faculty and teaching learning processes designed and implemented. Faculty derived the freedom of work and job satisfaction at the work place due to policies
implemented by visionary management. Due to this many managements like to inculcate best practices adapted in VIT, Pune.

4.1.2 Faculty Recruitment Process:
Because of the existence of a strong brand, many qualified candidates are attracted for teaching positions in VIT, Pune and as the number of applicants is very large, compared to the positions available, VIT, Pune has designed a specific recruitment process, within the framework of guidelines given by the UGC and University act.
The total process consists of five major stages:
1. Call of applications and scrutiny of applications to identify eligible candidates.
2. Conduction of objective type test based on fundamental knowledge and technical concept in respective domain on the lines of graduate aptitude test exam for engineers (GATE).
3. Short listing of candidates.
4. Classroom presentation on technical topic in the presence of a committee consisting of senior faculty.
5. Carry out interviews of these shortlisted candidates by selection committee constituted as per the norms, on the same day.
6. Appointment order / offer letter to selected candidates, on same day.
The time and period of recruitment is planned in such a way that newly joined faculty will be available well in advance before commencement of an academic year. After joining of these candidates, induction training is conducted and they are made aware about expectations of the management from them. The main focus of induction training is role of a teacher, effective teaching learning process, importance of student’s feedback and monitoring mechanism used by the Institute.

4.1.3 Students Feedback Process:
The primary objective of conducting feedback is to understand the perception of the students about effectiveness of teaching a course/subject by a teacher. A well structured questionnaire which was evolved after consistent research is defined to know teachers performance from student’s perspective, about teaching learning process. The frequency of conducting the feedback is twice in a semester for every subject and for every teacher. The analysis of feedback is conveyed to the respective teachers and if required they were counseled by Head of the department / Principal/ Director for further corrective actions. This has resulted in continuous improvement in teacher’s academic performance. Every teacher’s performance index (PI) at institute
level as well as department level is calculated and the best performing teachers (those who score above a benchmark) are appreciated with cash prize every year. This process is in place since 2002 till date. The outcome of this process has resulted in following activities:

1. Improvement in T-L process at all levels (UG & PG).
2. Weakness of teachers was identified, for mentoring of teacher.
3. Student’s satisfaction level / and performance improved.
5. Branding of Institute.

This branding, due to pure academic discipline and development attracted many managements to the Institute, for guidance to start and run new Institute and replicate “VIT-Model”.

The brand name of the institute is result of the systems in place from many years (2000). Looking into these academic achievements, and branding, managements who wanted to start new institute in the state across different geographic locations and affiliated to different universities, have been approaching for academic alliance with the management of VIT, Pune to implement the same philosophy at their institute right from the beginning.

VIT, Pune made formal academic alliance with these newly started Institutes and started exercising control over teacher identification, teacher training, implementation of T-L and monitoring process. This gave the researcher an opportunity to get associated closely with T-L process and monitoring of these Institutes, to carry out further research.

4.1.4 The Identified Institute for academic alliance:

 Identified Institute selected for study is owned by the respective management and having only academic alliance with Vishwakarma Institutes where by researcher could gain access to all Institutions.

Following engineering institutes made an academic alliance with VIT, Pune.

i.  Sanjay Ghodawat Group of Institutes (2009), Gate No. 583 to 585, A/P.

Atigre Taluka: Hatkanagale, Dist - Kolhapur, Hatkanagale, Maharashtra 416118

ii. Veerayatan Group of Institutes (2010), Bhuj Mandvi Highway, Haripar, Dist. Kutch, Mandvi, Gujarat 370460
iv. Sandipani Group of Institutes (2011), Kolpa, Nanded Rod, Latur 413512

The researcher was involved in teacher identification, training of teacher, establishment of T-L process and monitoring the process for institute Sr. No. (ii) to (vii).

4.1.5 Requirements for Understanding:

The management of respective institute and single point of contact (SOP) from Vishwakarma Institutes has mutually agreed upon:

a) No compromise on recruitment of teacher to satisfy AICTE/DTE/University faculty norms about teacher student ratio.
b) Academic control shall remain with Vishwakarma Institutes.
c) Management of newly established institute shall provide mandatory infrastructural support as per AICTE/DTE/University norms which includes but not limited to funds, buildings, IT infrastructure, Laboratory equipments, transport facility to students, hostel, library, canteen etc.
d) Management of newly established institute shall proactively get involved in various motivational initiatives which are deemed to be necessary for betterment of institute and create healthy environment for the teachers to get job satisfaction and for students to make them proud to be an integral part of the institute.
e) The period of academic alliance shall be minimum for five years to observe results/ outcome of the teaching learning process implemented.

Although initially seven institutes were part of an academic alliance and proposed research work was started with these institutes by the researcher. In due course of time, the data collection was discontinued with four institutes because of:

i. Closure of institute
ii. Discontinuity of academic alliance
iii. Frequent change of teachers (change of job by teacher)
iv. Frequent change in class time table due to administrative problems, local constraints and unforeseen problems.
v. Reluctance to share data though it was committed by institute’s management.

Therefore, the institutes which had continued with academic alliance were considered for further research work. The management of Vishwakarma Institutes was associated with these seven institutes which are located in rural locations in the State of Maharashtra, out of which two were established in 2011, three in 2012 and two before 2010. In all, more than five hundred teachers are currently employed in these institutions. The researcher was associated with his mentor who is a very senior academician in the field of engineering and technology. The mentor was entrusted with the responsibilities to recruit and train all the teachers to maintain academic standards, establish teaching learning process to ensure 100% admissions in the associated institutes. The researcher was fully involved in recruitment processes as well as conducting induction training program for all the teachers. These teachers are also available, for further interaction with the researcher. Induction training workshops were conducted for the entire new faculty recruited for the seven newly established institutes. These workshops and such workshops conducted in the earlier years, has formed the basis of hypothesis.

4.2 Research Methodology adopted by Researcher:
The research methodology consists of identification of newly established engineering institute, recruitment of teachers as per designed methodology, execution of induction program for recruited teachers as well as existing teacher if any, collecting the data about perceived qualities of teachers, identifying most important qualities of a teacher which would lead to a better teaching learning process (better results and employable as the outcome), segregating measurable characteristics from such qualities and then designing of a questionnaire for the feedback from the students, implement the feedback process and monitor performance index (PI) of a teacher on monthly basis to analyze relation between PI of teacher and university examination results at the end of semester / an academic year.

This process to be implemented at least 2-3 year in identified Institutes. Based on the outcome of this experimentation, suggest model to ensure effective T-L process and its monitoring which will enhance university result, number of admissions with quality student in Institute, ultimately leading to better job placement.
4.3 Type of Research
Out of four basic types (explanatory, conclusive, modeling, and algorithmic) of research, this research is of conclusive type with experimental type where researcher has studied effect of set of certain factors on the response / outcome. The proposed research was based on quantified facts for examining and hypothesis testing. Therefore it can categorize as quantitative research. Further research is based on evaluating the outcomes due to implementation of certain policies, plans over a period of two-three years for teaching learning process; researcher claims that it is a evaluation research type. The quantified facts and data collected were for three institute / organization so it becomes a part of case study.

4.4 Research Design
The selection of research approach was conclusive with experimental type.

4.5 Primary Data
This data is collected through ethnography and original in nature. This data is collected through technical tests conducted for recruitment, interaction in induction training for recruited teachers, academic feedback received from the students over the period of three years. Further primary data is collected by distributing/on line, the feedback questionnaire & getting it filled by the students. The primary data of academic performance of 100% students on roll is considered for experimentation viz. attendance, class test, and university results. For this purpose, manual method was used.

4.6 Sample Design
4.6.1 Sampling frame of population:
The researcher has studied and derived the statistical information regarding number of UG engineering institute available in the state since 1854 to 2014 from official website www.dtemaharashtra.gov.in and admission information brochure 2014-15 published by Directorate of Technical Education, Maharashtra. Table 4.1 shows that majority of the institute were started from 2000 onward. Total engineering institutes which are offering UG courses in Maharashtra up to 2014, were 376.
### Table 4.1 Number of Engineering Institutes region wise

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<tbody>
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<td>07</td>
<td>06</td>
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<td>02</td>
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<td>5</td>
<td>Nasik</td>
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<td>15</td>
<td>50</td>
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<tr>
<td>6</td>
<td>Pune</td>
<td>04</td>
<td>12</td>
<td>02</td>
<td>15</td>
<td>51</td>
<td>51</td>
<td>135</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>11</strong></td>
<td><strong>47</strong></td>
<td><strong>12</strong></td>
<td><strong>54</strong></td>
<td><strong>148</strong></td>
<td><strong>104</strong></td>
<td><strong>376</strong></td>
</tr>
</tbody>
</table>

*Source: [www.dtemaharashtra.gov.in](http://www.dtemaharashtra.gov.in)*

Classification of institute as rural, urban is as per information available on website. Out of 376 institutes, 169 are in rural, 162 in urban and 45 are located in semi urban as shown in table 4.2. There are some institute from Pune, Mumbai, Nagpur which are very close to city/ and or presently in Municipal corporation and gets all benefits of city, such institute are classified by researcher as semi urban. These institute are not considered as rural for further study.

### Table 4.2 Number of Engineering Institutes in Urban, semi urban and rural area

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Region</th>
<th>Urban</th>
<th>Semi Urban</th>
<th>Rural</th>
<th>Total</th>
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</thead>
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<td>Amravati</td>
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<tr>
<td>2</td>
<td>Aurangabad</td>
<td>18</td>
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<td>16</td>
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<tr>
<td>3</td>
<td>Mumbai</td>
<td>45</td>
<td>03</td>
<td>22</td>
<td>70</td>
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<tr>
<td>4</td>
<td>Nagpur</td>
<td>22</td>
<td>16</td>
<td>19</td>
<td>57</td>
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<td>5</td>
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<td>11</td>
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<td>33</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Pune</td>
<td>56</td>
<td>20</td>
<td>59</td>
<td>135</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>162</strong></td>
<td><strong>45</strong></td>
<td><strong>169</strong></td>
<td><strong>376</strong></td>
</tr>
</tbody>
</table>

*Source: [www.dtemaharashtra.gov.in](http://www.dtemaharashtra.gov.in)*

Table 4.3 shows region wise rural institute and the duration in which they are established. Up to 2009 total institutes were 272 which include 110 in rural and 162 in urban + semi urban area.
Table 4.3 Number of Engineering Institutes in rural area

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<td>Amravati</td>
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<tr>
<td>3</td>
<td>Mumbai</td>
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<td>10</td>
<td>33</td>
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<td>6</td>
<td>Pune</td>
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<td>01</td>
<td>03</td>
<td>22</td>
<td>29</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>01</td>
<td>19</td>
<td>04</td>
<td>16</td>
<td>70</td>
<td>59</td>
<td>169</td>
</tr>
</tbody>
</table>

Source: www.dtemaharashtra.gov.in

During 2010 to 2014 total institute were 104 out of which 59 in rural and 45 in urban/semi urban area. Table 4.4 depicts the detail break up of these institutes year wise.

Table 4.4 Breakup of institute during 2010-14

<table>
<thead>
<tr>
<th>Year</th>
<th>Sr. No</th>
<th>Region</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<td>Amravati</td>
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<td>0</td>
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<tr>
<td>2</td>
<td></td>
<td>Aurangabad</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
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<tr>
<td>3</td>
<td></td>
<td>Mumbai</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Nagpur</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Nasik</td>
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<td>1</td>
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<td>5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Pune</td>
<td>4</td>
<td>3</td>
<td>10</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
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<td></td>
<td>13</td>
<td>5</td>
<td>19</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: www.dtemaharashtra.gov.in

As the study is limited for the period of year 2010 to 2014, the process of identification of institutes was started in year 2011-12, so that proposed experimentation could be executed for another 2 years to observe outcome.

Hence the population was defined with 21(in 2011) rural institutes. Out of which 5 institutes were identified as sample from geographically different location across state of Maharashtra.
Researcher has started collecting the data from such 5 identified institutes. In order to monitor the performance of teacher and student, consistency of collected data over the period of at least for 2 year, was one of the essential components of research work. Due to unavoidable reasons as mentioned in 4.1.5(Requirements for Understanding), it was possible to continue only with 3 institute out of 5.

4.6.2 Sample design for Teacher and Students of newly established institutes:
The researcher has selected teachers and students from three institutes in rural area identified through non probability sampling method, convenience sampling and purposive / judgment sampling. The rationale behind identifying these institutes is,
- All the institutes are engineering institutes approved by AICTE, New Delhi.
- Affiliated to different universities due to different geographical area.
- Functioning academic year is same i.e. 2012
- Self Financed Private Institutes
- Following same working culture although management and trust of these institutes is different.

4.7 Recruitment of Teachers
For recruitment of teachers, the traditional method to advertise the posts in the leading news papers was adopted. The applications were invited and scrutinized as per the university norms. The shortlisted candidates were called for a written test which was exclusively designed based on GATE (Graduate Aptitude Test in Engineering) examination. Further, successful candidates in the examination were called for a classroom presentation followed by technical and personal interview. The candidates with satisfactory performance in above mentioned process were appointed as a teacher.

4.8 Induction Training
In order to enhance understanding of the fresh teachers and to carry out their induction training, the researcher has conducted induction training programs for such teachers at several institutions, spread over various locations in the geographical area in the State of Maharashtra.
During the three/four day’s induction training, the groups were formed with random selection. The following questions/activities were posed to the participating teachers:

1. What is the meaning of induction training?
2. How many of you have studied UG/PG from the college which is far away from this place?
3. What would you like to be in the next five years?
4. Why have you joined the teaching profession?
5. Why have you joined this institute?
6. Do you remember any of your teachers who taught you during your studies? If yes, why do you remember him/her?
7. What do you mean by teacher?
8. What do you understand by quality?
9. What is teacher’s perception about quality in education?
10. What are the essential and desirable qualities of a good teacher?
11. What could be the minimum common qualities that all teachers of our institute must possess to get good university result? (Group Activity)
12. According to you, who will test these qualities of teacher?
13. Are these qualities measurable and how are you going to measure it?
14. What are ethical values to be adopted in the teaching profession?
15. What are teacher’s expectation/perception about students?
16. Perform individual SWOT (Strengths, Weakness, Opportunities, and Threats) Analysis. (Individual Activity)

In response to the two days workshop at various locations, the answers were collected and analyzed.

Table 4.5 Interaction during Induction Training

<table>
<thead>
<tr>
<th>Que.</th>
<th>Ans.</th>
</tr>
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<tbody>
<tr>
<td>What is the meaning of induction training?</td>
<td>Understand institute’s culture, Organization’s structure, various systems of organization/department, knowing the colleagues, policies, rules and regulations of the institute, communication systems, to reduce the initial anxiety of newly joined faculty feel in a new institute, to familiarize the new faculty with the nature of job, people, work-place, work environment and the management.</td>
</tr>
<tr>
<td>How many of you have studied UG/PG from the college which is far away from this place?</td>
<td>Here the objective is to find spectrum of teachers from geographical area.</td>
</tr>
<tr>
<td>Que.</td>
<td>What would you like to be in next five years?</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>Ans.</td>
<td>Objective is to understand what the ambitions/plans of their career are. The answers were to become administrator, entrepreneur, teacher, researcher, complete PhD and so on..</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Que.</th>
<th>Why have you joined teaching profession?</th>
</tr>
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<tbody>
<tr>
<td>Ans.</td>
<td>To get satisfaction, they like teaching, self improvement and earning, to do something for community, passion, student’s development, knowledge improvement, to do research, plenty of free time available, to do business, hobby, interest in teaching, remain connected with student and people, develop our own country, preserve character in life, get respect, noble profession, safe and secured for female, no other job in hand…</td>
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</table>

<table>
<thead>
<tr>
<th>Que.</th>
<th>Why have you joined this institute?</th>
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<tbody>
<tr>
<td>Ans.</td>
<td>Brand name, good university results, nearby my residence place, placement record, recognized institute, regular and good salary, regular increments, acceptable policies, constraint of family, teaching techniques are good, safe and secure location, low living index, good facilities in the institute, working systems, scope for self-development , supportive and healthy environment, better opportunity…</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Que.</th>
<th>Do you remember any of your teachers who taught you during your studies? If yes, why do you remember him/her?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans.</td>
<td>Good human being, communication skills, teaching style, conceptual explanation, interesting lectures, helpful in nature, punctuality, excellent knowledge, friendly nature, well disciplined, dressing sense, strict, punishment given, teaching with real time examples and its correlations, a person who changed my life, overall personality, a philosopher, use of understandable/ local language, impressive, unbiased…</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Que.</th>
<th>What do you understand by quality?</th>
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<tbody>
<tr>
<td>Ans.</td>
<td>Fitness for the purpose, conformance to the requirement, degree especially high degree of goodness and worth as per oxford dictionary…</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Que.</th>
<th>What is teacher’s perception about quality in education?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans.</td>
<td>Teach the student in such a way that student remember/ understand what you want to remember by them is a quality of teaching.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Que.</th>
<th>What are the essential and desirable qualities of good teacher?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans.</td>
<td><strong>Essential</strong>: Qualified, Good academic background, role model to student, command on subject, Interactive, conceptual, audible, knowledgeable, punctual, self confident, well prepared, faith in teaching, motivator, positive attitude, ability to make subject interesting, time management, impartial, active, honest, good listener, communication skills, understandable handwriting, command in class, use of effective methods to remove fear of subject, dedicated, takes care of job placement , counselor, devoted and visionary, ready to accept change, available to students, loyal, forgiveness in nature, parental care, good communicator, good in pedagogy, <strong>Desirable</strong>: focused, updated, clean character, polite, friendly, gives real…</td>
</tr>
</tbody>
</table>
time examples, disciplined, solution provider, actor, sense of humor, initiator, physical fitness, good reader, record keeping, involves students in productive work, conversant with teaching aids, spiritual, dressing sense, supportive to the students, helpful, researcher, hardworking, administrator, respect others feelings, planner, industrial experience, good judgment, interdisciplinary approach, qualification improvement, responsible, learner, maintain hierarchy, knowledge about country, tolerance, good leader, understanding of problems of the student, implementation of ideas through projects, happy personality, innovator, social person, well appraised on current affairs.

Que. What could be the minimum common qualities that all teachers of our institute must possess to get good university result?

Ans. Priority wise common qualities of teacher identified through group activity

- Technical excellence/ subject knowledge
- Teaching Skills/ Communication skills
- Good Student
- Punctual and Regular
- Impartial/ Unbiased
- Creative/ Innovative
- Inspiring/ Motivating
- Administrator
- Character
- Friend/ Philosopher/ Guide

Que. According to you who will test these qualities of teacher?

Ans. Management, Head of the Department, Peer, Self Evaluation, Students, Third party evaluation. Majority of the participants said – student’s feedback.

Que. Are these qualities measurable and how are you going to measure it?

Ans. After the question realized by the participants, the participants changed/modified the quality parameters as follows:

- Subject Knowledge
- Correlate real time examples
- Well Prepared
- Communication Skills
- Clarity of presentation
- Interactive
- Control over the class
- Availability of teacher outside the lecture hours
- Regularity and Punctuality
- Demand of same teacher for next semester

And the induction training concluded with expectations of management from teachers and vice versa.
The outcome of the induction program was, the participant have clearly understood their role as a teacher in the development of the institute. They are focused to become a good teacher by inculcating the identified and expected quality parameters of a teacher.

4.9 Key Performance Indicators (KPI)

Following are the Key Performance Indicators (KPI) to monitor the academic progress of an institution.

1. Lecture schedule – The Head of the Institute (HOI) is expected to issue a time table to all the students and staff right from the commencement of the semester. HOI is expected to keep track of number of lectures scheduled against actually engaged on a daily basis per class and on weekly basis per subject, course, staff and class.

2. Attendance – The HOI will organize to record the attendance of all the students attending lectures / practicals / term work. The record of the attendance for each subject and for every student is to be maintained on a daily, weekly and monthly basis.

3. Lesson plans – All the faculty teaching various subjects / practicals / term work are supposed to prepare, submit and announce their lesson plan for the course work at the commencement of each semester. The HOI will organize to receive the success in terms of percentage of completion of the lesson plans for the individual subject and faculty on a weekly as well as monthly basis.

4. Question bank – The teachers are supposed to go through the University examination question papers for the previous semesters and prepare a question bank on similar lines for every topic in the curriculum of the particular subject. A one hour written test shall be conducted for every subject on a monthly basis and question bank for each examination be separately handed over to the students at the beginning of each semester.

5. Result analysis – After the completion of a semester and when the results of the previous university examinations are available, then, percentage result per course, per faculty, should be prepared.

6. Students’ feedback – The performance evaluation of all faculties by the students will be considered as a mandatory requirement for all theory subjects. It should be carried out at the end of each month / four week period.
The evaluation of performance of teacher is based on the above Key Performance Indicator s (KPI) through mechanism of feedback given by students on structured and close ended questions.

**4.10 Questionnaire for Students Feedback**

In order to create more understanding amongst teachers and learners and to offer an opportunity for improvement in the teaching learning process to the teachers, a feedback form was developed with closed ended questions of both the types where respondent have to select one from given multiple choice and questions with rating scale, to seek feedback from all the students about measurable qualities / parameters of teaching of every individual teacher. The feedback sessions were conducted at the end of every four weeks of teaching, i.e. minimum two or three times in a semester.

Following are the points on which this appraisal was carried out, either in hard or soft form. The students have to choose one of the options for each parameter monitored like Good (5) / Average (3) / Poor (1).

a. Knowledge  
b. Regularity  
c. Punctuality  
d. Communication skill  
e. Presentation on blackboard.  
f. Interaction during the class.  
g. Effective communication for better understanding of the students.  
h. Satisfactory completion of lessons planned.

The format implemented is as follows:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Question</th>
<th>5</th>
<th>3</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.1</td>
<td>Has the teacher given you</td>
<td>Yes</td>
<td>No</td>
<td>Don’t Know</td>
</tr>
</tbody>
</table>

Note: Rational for the feedback: Dear students, this feedback would allow a teacher to consider your suggestions and make necessary improvements in his/her teaching, if required. It will encourage better teachers to become the best. It is necessary that every student should give his/her opinion, here below, without any prejudice. Please respond to all the points by putting a tick mark to the appropriate option below.
| Q.2 | Has the teacher given you question bank for the forthcoming class-test, in advance? | Yes | No | Don’t Know |
| Q.3 | Does the teacher conduct the class exactly as per the time table? | Always | Many times | Sometimes |
| Q.4 | Does the teacher engage all classes regularly? | Always | Many times | Sometimes |
| Q.5 | How is the handwriting / drawing of the teacher on the blackboard? | Good | Average | Poor |
| Q.6 | Does the teacher interact with you in the class? | Always | Many times | Sometimes |
| Q.7 | Is the teacher audible in the class? | Very much | OK | Poor |
| Q.8 | Does the teacher explain the concepts to you properly? | Always | Many times | Sometimes |
| Q.9 | Has the teacher completed lessons as per the plan given to you? | Yes | No | Don’t Know |
| Q.10 | How do you rate his / her teaching? | Good | Average | Poor |

A student is free to make any comment here:

_____________________________________________________________________
_____________________________________________________________________

… End of the format …

4.11 Procedure for calculation of Performance Index (PI) : for individual teacher for a particular subject for a particular division

Performance Index is to be determined for every question separately and average of all ten questions will be the overall Performance Index of the teacher for that particular class and subject.

Performance Index is calculated as follows:

\[
PI = \frac{\sum 5x + 3y + 1z + 0r}{5(Strength \ of \ Class \ or \ Students \ on \ roll)} \times 100
\]
Where ‘x’ is a no. of students who have said (ticked) ‘yes/good’ (5 marks), ‘y’ is a no. of students who have ticked ‘No/Average’ (3 marks), ‘z’ is a no. of students who have ticked ‘Don’t know/poor’ (1 mark), ‘r’ is a no. of students who were absent at the time of feedback (0 Mark)

4.12 Academic Performance monitoring of students

The students are monitored through following parameters:

a) Classroom Attendance: A class teacher is appointed for every class/division. All the teachers teaching that class submits the attendance record at the end of the month to the class teacher. The compiled record of a class is displayed on notice board in consultation with the head of the department. The class teacher identifies the irregular students and asks for the reason. At the same time the absenteeism is informed to their parents and invites them on the campus in case of serious reason. The role of class teacher is to counsel the student and parents. This process is carried out throughout the semester.

b) Class Test / Online Test: A class test/online test is conducted twice or thrice in a semester for each subject and the performance is monitored individually.

c) University Examination: The performance of individual student for all subjects is complied and monitored after the declaration of the University Result.


After the compilation of university results, the performance index of a teacher for respective subject is attached to evaluate the performance of a teacher in the respective subject. This exercise is carried out to find the impact of performance index on attendance, class test and university result.

This procedure is carried out for the first year and the second year engineering classes/divisions at two institutes, geographically located at different locations and different affiliating university. The 100% students’ data was collected for the two consecutive years (4 semesters) in institute A and 3 years (6 semesters) in institute B.

4.14 Secondary Data

Secondary data is used to study the perspective of various authors, reputed and controlling Govt. authorities like AICTE to understand the growth of technical
education as well as norms and standards to establish the institutes, NAAC and NBA
to understand parameters of quality for established institute and individual program,
NPIU for understanding impact of implementation of TEQIP project and associated
Key Performance Indicators (KPI), DTE and Maharashtra University Act for
understanding the processes and systems defined, NASSCOM for understanding the
employability issues and the concern of industry, reports of Central and State
Government on quality of technical education, and higher education.