CHAPTER 5
RESEARCH METHODOLOGY

5.1. Introduction.

Assessing the knowledge transfer and implementation of knowledge management on the eminence of IT Faculty members of Colleges under University of Pune is the principle concern in this research. In this section, the approach used to manage the investigation of this study is proposed. This unit describes the proposed plan to outline the investigation which was conducted and the verified theories.

It also defines the research project and sampling project followed by conferences about the methods utilized in the training and data gathering techniques. The tool validation and testing used may consist of statistical examination techniques. The analysis method is then cross-examined to be implemented and to recognize the limitations that are vital in the project having interpretations for successive conclusions.

Prime attention should be on the importance of knowledge management and knowledge transmission applications by faculty members working with Institutes/colleges as lecturers, assistant professors, associate professors, professors and directors.

A Faculty member who possesses certain knowledge checks the recognized and verified framework for knowledge whether transmitted or not. Further, knowledge gained and the methods adopted by the faculty members to gain any such knowledge have been examined. Adaptability to the changes made in the syllabus has been studied by faculty members along with the methods they have adopted whether suits the requirements or not.
5.2 Statement of the Problem.

Knowledge changes from one person to another and from one generation to another. This study aims at applying knowledge possessed by faculty members in carrying out their routine work of transmitting the knowledge to the students.

It is quite oblivious that before disseminating the knowledge to the students, they must try to check the questions that may come from the students regarding the topic under consideration. Before delivering the information, a faculty member must know the ACRUSUCUC concept which is mentioned herewith:

a. Accurate – Faculty members must conform whether the information is true, provable and truthful. Accurate subject information is based on the practical data and can be official by linking sources or checking for internal reliability.

b. Current – Faculty members may use the information that can be applicable in the present time. It is generally accepted that career and education information should be revised and restructured at least annually to be current.

c. Relevant – Faculty members must check that significant information is applied to the benefits of the individuals who use it for the results they are facing.

d. Specific – Faculty members must be specific for the facts which make real sense. The explanations are often interesting and can provide a background for further analysis, but, specific facts are vital for realistic planning and decision making.

e. Understandable – Faculty members must understand the genuineness of the information before they deliver it to the students. Data must be analyzed to its maximum extent and then converted into words. A Faculty member while presenting the information should avoid doubts and be informative to the intended students.

f. Comprehensive – A Faculty member must confirm that the facts include all the important lessons within its scope of coverage.
g. Unbiased – A Faculty member must take care that the information being created and delivered shall be unbiased, while, the individual or group delivering the facts has no deliberated interest in the decisions or plans of the student.

h. Comparable – In order to make comparison easier, faculty members may present information of persistent collection, analysis, and gratified format.

Knowledge Process Cycle (KPC) has been adapted by many faculty members. The faculty members who understand KPC concept are always considered as good students by their teaching. Apparently, the faculty members follow the method of adapting the knowledge process cycle, i.e., following sources for knowledge gaining, storing, using them during the class while delivering, updating and applying the knowledge thus gained for future use.

5.3. Importance of the Study.

In the world, India has progressed to become a knowledge determined economy. People in the country will be looked as Knowledge oriented and each faculty member in India is considered to be the guru. From ancient days, teachers or gurus have been transmitting their knowledge to the shishyas or students in schools or gurukuls. When the faculty member takes his/her place as the guru and students as shishyas, the knowledge is always transferred from faculty members to the students. It is the important that knowledge management tools are being transferred from one generation to the other.

There are too many challenges faced by faculty members in the educational environment. Knowledge transfer in the field of education must be considered as a trail to establish, create, capture or distribute knowledge which ensures its availability for future users. It is always considered that the faculty member shall make use of ACRUSUCUC concept. Each part of the IT subject is new and innovative ideas shall be necessarily created in order to develop curiosity in the subject. Therefore, driving force for some new ideas may
come up. Faculty member who has accepted the challenges of teaching IT subject tends to have logical and innovative thinking. Researcher is primarily focused on assessing the knowledge transfer and knowledge management application on the quality of IT Faculty members of Colleges affiliated to University of Pune. A faculty member shall be knowledgeable in order to transmit the knowledge.

Researcher tries and analyzes an approach wherein he can accelerate research for this study. Further, study initiates with replication of the challenges and the research questions that define the realistic design. Based on the research, the following segment describes the hypothetical context in which the research was piloted and offers the hypotheses that were verified. Further it defines research project and sample project monitored by negotiations of the actions taken, the data gathering techniques and the data investigation techniques which include instrument validation. He/she is expected to decide pedagogy depending on the students attending the session. Based on the study, researcher may have drawn consequences for subsequent inferences from the results and data analyses.

Main emphasis stands on the impact of knowledge management and knowledge transmission carry outs on the faculty members working as Lecturers, Assistant Professors, Associate Professors, Professors and Principal or Director of a College or an Institution. The arrangement and factors for the analysis give an emphasis on knowledge gained and transfer the same to the students in the learning environment.

Researcher shall herewith focus the two main focus areas: Knowledge Creation and Knowledge Transmission. In both the cases, an operative knowledge management system must report both formation and transmission which may be considered as tacit knowledge. Researcher has shown how the implicit knowledge of faculty member could be used and converted into explicit knowledge while conveying it to the students. The accomplishment of conversion of educator’s tacit knowledge into explicit knowledge should be done from faculty
member to the students. Further, knowledge process cycle concept is examined and it is thereby understood that how faculties convert the knowledge they have gained. Accordingly, they start teaching the said subject to the students (i.e. the conversion process).

5.4 Scope of the Study.

University of Pune conducts different courses under different streams i.e. after HSC from First Year to the Ph. D. The scope of the study is restricted to Colleges and Institutes affiliated to University of Pune conducting IT and computer related courses which are only non-engineering base such as MCA, MCM, MBA (CS), M.Sc. (CS), BCA, BCS, B.Sc. etc. Only the faculty members who are on the payroll of the Institute or College are considered and Visiting Faculty / Adjunct Faculty members are not considered for study purpose. This study is limited to urban colleges though it was given in title as Pune region as majority of colleges come under this area.

5.5. Purpose & Objective of the study.

Purpose and objective of this study is to observe the influence of knowledge management practices and implementation of producing excellent knowledge. This study is based on Information Technology (IT) faculty member and its likely relation towards pupil knowledge by reporting the problems mentioned below:

a. To study the sources of knowledge acquisition.

b. To study the knowledge creation, development and utilization by the IT Faculty members.

c. To understand the skills and motivational factors in retaining the knowledge acquired by the IT faculty members.

d. To analyze the use of 360° feedback mechanism to get best outcome in teaching adopted by the management institutes.
e. To understand feedback mechanism adopted by the management institutes/college in maintaining and upgrading the knowledge of IT faculty members on regular basis.

f. To analyzed problems experienced by the IT Faculty members in acquiring modern information technology to sustain.

g. To compare the digital learning methods of teaching with traditional one for the IT Faculty members.

University of Pune is providing different ways for promotion of learning and emerging strategies of knowledge. Sponsorship of various programs like Quality Improvement Programme (QIP), Faculty Development Programme (FDP), Skill Development Projects and Refreshers Course/Workshop etc. helps in Information Technology.

5.6. Hypotheses of the Study

The study includes the analysis of the knowledge in IT which has been gained by the faculty members in the past and how exactly and aptly they are applying their work.

**H**₁: The knowledge acquired by IT faculty members differs from digital and traditional teaching.

**H**₂: Digital or traditional teaching method doesn’t make any difference in the knowledge acquired by the IT Faculty members.

**H**₃: Performance appraisal system used by management institutes helps in monitoring Quality in IT education.

**H**₄: The faculty members make use of knowledge process cycle (KPC) for updating their knowledge significantly.

5.7 Research Methods.

5.7.1. Research Design.

Researcher has understood and knows the methods that have been used and determined as different sources of knowledge that were tapped and analyzed. Efforts have been on the focus how knowledge is created and managed by the faculty members. The entire group
could be divided into two: one who seeks knowledge and another who delivers the knowledge.

Various efforts are taken analytically to refer situations, challenges, incidence, facility or programme which may give information about the situations of living of a community or description of approaches leading to an issue which is considered as vivid research. Establishing the efforts to identify, realize or establish the presence of a link or interdependence between two or more characteristics of a condition is considered as Correlational research. Various efforts are taken to explain reasons and the causes between two or more aspects of a situation and are called as Illustrative research.

The researcher has used exploratory study to carry out the research in education. Research is commenced to discover an extent where little is acknowledged or considered to the likelihoods of undertaking a particular study in feasibility study/pilot study and is called exploratory research.

Organized surveys and interviews imply the use of a questionnaire. The most common tool used in data collection is construction of an investigation apparatus which serves as the most significant part of a research project. The conclusion may be based upon the data which researcher has collected and the information collected from the respondents.

A questionnaire includes group of interrogations offered for responses. The respondents read the interrogations, understand the projected and then mark their responses. Questionnaire shall be designed and tested carefully before it is utilized on a large scale. Suitable method for collecting descriptive information is organized surveys using proper lists of questions asked to all the respondents in the same manner.

The researcher has gathered primary data by personally visiting different colleges/institutes and asking them to fill the questionnaire personally or through the head of the department by going on the field work. The said data is appropriately analyzed with the
use of SPSS (Statistical Package for the Social Sciences) package with version 19.0. The researcher has used statistical methods such as averages, percentages, comparison, and cross-tabulation. Over and above, the techniques of hypotheses testing are also used. Essential graphs and charts have also been prepared to upkeep the examination of the data wherever required.

Being a part of the study of social research, survey method has been adopted and a Questionnaire has been designed. For the purpose of this study, Questionnaire has been personally circulated among the faculty members and the data has been collected. The simplifying group is often called the population in the research study. As compared to other streams, IT contains domain subject knowledge and has a higher updating rate. It reflects the dynamic nature of IT syllabus containing technological advantages.

5.7.2. Universe – Population.

Pune is the second largest city in the western region of the state of Maharashtra. Due to centrally located place in India and certain facilities and educational amenities, it is having more than hundred educational institutions and nine universities as well as developing industrial facilities. Pune city is an administrative center and now an important industrial hub with reference to IT Industry. As compared to any other fields, the IT field contains domain specific knowledge and change at a higher rate in the selection of IT fields. Jawaharlal Nehru stated Pune as "The Oxford of the East" due to its reputed academic and research institutions. Pune very peaceful and safe city compared to other educational cities in India and is therefore more preferable option for the foreign students. Pune's economy is determined by its manufacturing industry. However, Information Technology has become increasingly prominent from the last decade.
Table 5.1: List of Colleges and Institutes under University of Pune

<table>
<thead>
<tr>
<th>District</th>
<th>Colleges</th>
<th>Institutes</th>
<th>Research</th>
<th>B.Ed/ MEd</th>
<th>Law</th>
<th>B Pharm/ M Pharm</th>
<th>Engineering</th>
<th>Architecture</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pune</td>
<td>168</td>
<td>126</td>
<td>135</td>
<td>7</td>
<td>6</td>
<td>28</td>
<td>44</td>
<td>9</td>
<td>583</td>
</tr>
<tr>
<td>Ahmednagar</td>
<td>56</td>
<td>16</td>
<td>16</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>Nasik</td>
<td>70</td>
<td>26</td>
<td>21</td>
<td>8</td>
<td>13</td>
<td>12</td>
<td>174</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: [www.unipune.ac.in/affiliated_colleges_and_institution/colleges_list_updated.pdf](http://www.unipune.ac.in/affiliated_colleges_and_institution/colleges_list_updated.pdf) (Year 2014)

5.7.3. Sample Selection.

Researcher understands the importance of use of “Knowledge”. The researcher has been associated with many Educational Institutes staying in Pune and has decided to go for the subject. This research offers an experimental examination of the association between information qualities.

<table>
<thead>
<tr>
<th>District</th>
<th>Colleges</th>
<th>Institutes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pune</td>
<td>168</td>
<td>126</td>
<td>294</td>
</tr>
</tbody>
</table>

*Source: [www.unipune.ac.in/affiliated_colleges_and_institution/colleges_list_updated.pdf](http://www.unipune.ac.in/affiliated_colleges_and_institution/colleges_list_updated.pdf) (Year 2014)

<table>
<thead>
<tr>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>198*</td>
<td>96</td>
<td>294</td>
</tr>
</tbody>
</table>

*No. of Colleges/Institutes selected.
The researcher after going through the data came to a result that, from the total of 294 Colleges/Institutes, 198 urban colleges/institutes are considered while the remaining numbers of rural colleges aren’t taken under consideration. Respondents from 43 Colleges/Institutes were selected and from them only full-time faculty members’ data is considered for the required sample. The above 43 Colleges/Institutes distributed Questionnaires to 700 Faculty members from which 301 Faculty members have been selected. The Questionnaires were distributed among the selected colleges from which 10-15% faculty members were approved based on the available list with the colleges. The data which we have researched in the form of completed Questionnaire has been used for further research.

Being as part of the study of social research, survey has been conducted. The Purposive Sampling Method is used to select required sample. The required list of colleges/Institutes under Pune and PCMC were obtained through university website. Further, only faculty member working in the Institutes/Colleges under the capacity of teaching or approved faculty member’s data will be considered as Lecturers, Assistant Professors, Associate Professors, Professors and Principal/Director of the colleges and institute.

5.7.4. Tools used for selection of Primary Data.

There are different tools that may be used as Primary data. This data is gathered through sources such as personal interviews, questionnaires or surveys with a specific objective on a particular matter, observation and conversation by the researcher. It is a direct and lengthy method where results are used for the purpose for which they were actually planned. Among the different tools, a questionnaire is a research tool. A Questionnaire may be comprised of a series of interrogations and other prompts for the determination of collecting information from the sources (like respondents). Questionnaire is used by the researcher to carry out the designed for statistical investigation of the responses.
Questionnaires (invented by Sir Francis Galton) have an edge over other forms of assessments. Questionnaires are strictly limited by the fact and often have uniform answers that make it easier to collect and assemble the data. In some demographic groups, conducting an assessment by questionnaires may not be substantial.

A questionnaire is an examination tool comprising of a series of interrogations and other prompts for the purpose of collecting information from the respondents. A questionnaire is direct action which was originally planned. Primary data can be considered as data being processed into collected information.

Researcher has designed a Questionnaire and data has been collected in two different forms: a. Personal Information and

b. Research Questionnaire. (Appendix –I).

5.7.5. Secondary Data.

In addition to the Primary data, the Secondary data has been studied by reading various articles and different methods followed by authors used to study the practices. The secondary data is gathered from well-reputed journals and magazines, newspapers, articles, internet websites and other collections. For collecting this data, the investigator has visited numerous libraries and read the articles. Researcher has visited Tilak Maharashtra Vidyapeeth’s Library and University of Pune’s Jaykar Library, Sinhgad Institute’s Library and many articles of the ISSN and ISBN books and has been studied from other colleges’ library. It is observed that no research has been carried out in this regard. To understand the difficulties faced by the faculty members, the Researcher attended the Faculty Development Programmes and Workshops organized by the University of Pune. FDP and SDP are considered as Knowledge updating programs. During the course curriculum of Ph.D., the Researcher attended the workshop at Tilak Maharashtra Vidyapeeth, Pune.
5.7.6. Data collection method – Questionnaires.

To check the Questionnaire researcher has done the pilot study by Questionnaire method. A Questionnaire is designed by applying 50 of 150 tools of teaching generally used in colleges/institutes. Researcher has done this by personally visiting the college and asking the individual to fill up the questionnaires. Probabilistic sampling practice helps to send survey reports and additional notices.

Response statistics were gathered from the faculty members from the colleges/institutes to conclude the answering rate. From every college 10-20 questionnaires are given and from them responses received have been used as sample as this method is an unbiased manner to choose the sample and it is judicious to simplify the outcomes from the example back to the population.

After going through the statistics, researcher observed that Questionnaire has most of the questions which were never answered. Some of them left incomplete and some questions were wrongly interpreted. Researcher observed that around 197 questionnaires that were collected didn’t come to the conclusion or observations. This has been considered as a failure on researcher’s part as most of the questions were open ended.

Researcher once again designed questionnaires and collected the data by personally approaching the faculty members who are on the payroll of the colleges or institutions. The results were positive and very much supportive to the Questionnaire.

5.7.7 Statistical Techniques.

To test the questionnaire, researcher has done the pilot study by Questionnaire method. The results were positive and very much supportive to the Questionnaire. A pilot study has been exercised and the problem area has been identified. The changes have been made and once again a Questionnaire was prepared by the researcher.
Data was collected by personally visiting the Institutes or Colleges and distributing the Questionnaire to the Head of Department or Faculty members. At the end of the survey, the data was stored into a file and then entered into an Excel spreadsheet. Researcher’s computer was protected from illegal access and additional activities. Data has been backed up from the computer and draft has been sent to Gmail account, Compact Disk and Pen Drive. The data will be kept in possession after the publication of the results of the research.

Gathered data and fed into MS-Excel were examined, defined and evaluated using SPSS (Statistical Package for the Social Sciences) for Windows. A sequence of numerous reversion evaluates were organized to check the key influence hypotheses all by numerous independent variables and a single dependent variable.

Researcher has used statistic methods such as averages, percentages, comparison and cross-tabulation. Further, the methods of hypotheses testing are also used. Essential graphs and charts have also been organized to maintain the analysis of the data wherever necessary.

5.8 Testing of Hypotheses.

Testing of hypothesis guides the direction of the exploration study. It identifies facts that are applicable and inapplicable. The hypothesis has been tested on the basis of various statistical tools and criteria. As a result of the nature of available data, only the criteria norm majority has been used in testing hypothesis.

For hypothesis No. 1 and hypothesis No.4, statistical tools such as Cross-tabs, Z-test statistics etc. have been used with 5% significance level. As the sample sizes are ≥ 30 normal approximations are satisfied. In this case Z-test and one proportion is involved. An alternative hypothesis is in terms “if less than”. Therefore, rejection area is exclusively on one side and hence, it is one tail test. The decision rule is that if the calculated value of z > 1.64, then it rejects the null hypothesis and if z < 1.64, then it accepts the null hypothesis (H_o).
For hypothesis No.2, Chi-square test is applied with 6 degree of freedom at 5% level of significance.

For hypothesis No. 3 statistical tools such as average mean, standard deviation and Z-test statistics etc. have been used with 5% significance level.

For hypothesis No.4, Chi-square test is applied with 6 degree of freedom at 5% level of significance.

5.9. Time Budgeting.

To study the knowledge transmission and knowledge management application on the quality of IT Faculty members of Colleges under University of Pune, the researcher has focused on the study duration from 2009-2010 to 2014-2016. After the pilot study, researcher identified some areas which needed some changes. The changes thus made have been used as the questionnaires as primary data.

5.10. Limitations of the study.

This segment deliberates constraints recognized for the evaluation used in this study. Such constraints have three broad groupings: limitations of survey research, faculty members and the statistical analysis techniques used in this study as well as the problem of casual uncertainty.

5.10.1. Limitations of Survey Research.

Under investigation, the validity of survey research is dependent on the level to which the replies precisely reveal the perceptions of the applicants and the extent to which those perceptions reflect the real-world circumstances. It has checked and mentioned the usage of common day to day tools. Such limitations can be moderated through simple consideration towards the design of the survey tool and the extent of the limitation which can be evaluated by examining the construct validity of the instrument/tool. The method used for this study was developed using accepted practices and majority of the items used in this method have
already been legalized. As the study continues, researches have come across few more tools like m-computing, U-leaning etc. Further, tests were conducted to judge the validity of remaining elements as described earlier in this chapter.

5.10.2. Limitations of Faculty Members.

Faculty Members keep on changing their jobs and therefore are a constraint in the survey. During the course of study, the researcher has observed that faculty members were kept on for an academic year. This is a constraint itself since they keep on changing their colleges/institutions considering their mental satisfaction and their monetary benefits.

5.10.3. Limitations of the Statistical Analysis Techniques in this Study.

Researcher has carried down the multiple regression analysis which was experimented as the prime method used in this study. As conversed earlier in this chapter, this method is built on numerous conventions concerning the statistics supporting the theories. As described earlier, each of these conventions was experimented and for extending the viable; data alterations were operating to meet the conventions. In those cases where the assumptions could not be done for such alterations, the statistical power of the analysis was summary and any explanations were restricted accordingly.

Recognized relationships between independent and dependent variables illustrated in Chapter 6 (Data Presentation, Analysis and Interpretation) propose the presence and different magnitudes of the outcome of convinced influences proceeding knowledge transmission and knowledge management of faculty members of Information Technology. It is a challenge analyzing the correlations between variables. The results being inherently uncertain are inevitable.
It is necessary that understandings are complete with cautiousness, full consciousness and acknowledgment of the essential uncertainties. Casual uncertainty or casual approach of the faculty members in the questionnaire makes the judgmental decisions a challenge for the researcher. Positive of the requests shall be discussed in Chapter 7 i.e., “Findings, Suggestions and Scope for Further Research”.