Chapter - 3

RESEARCH DESIGN AND METHODOLOGY

The research study has been carried out in the area of engineering education with respect to enhancing the effectiveness of teaching through communication skills training for engineering faculty members.

Research design and methodology in this study involves survey type quantitative, qualitative and mixed design approaches.

3.1 OBJECTIVES OF THE STUDY

1. To identify specific gaps in skill set of engineering faculty and common areas of improvements required in respect of communication skills.
2. To analyse the need for the pre-service and in-service training for engineering faculty members in communication skills in the University set up.
3. To identify suitable training modules/programmes required to enhance the communication and teaching skills of engineering faculty members.
4. To develop training modules suited for engineering faculty members.
5. To organize the need based training programmes in communication skills at the University level for engineering faculty members.
6. To identify key learnings and challenges.
7. To study and assess the impact or effectiveness of such training modules/programmes offered to engineering faculty members.
3.2 METHODOLOGY ADOPTED IN THE STUDY

1. Oral sample presentations of faculty have been studied and evaluated (i.e. pre-training skill evaluation)

2. Identification of training programmes required.

3. Design of a five-day training programme and development of training modules such as, creating a positive first impression, simplifying complex information, communicating with greater impact, responding to difficult classroom situations and inspiring peers and students to embrace change.

4. Administering the training modules to faculty in batches; each batch comprising 25-28 faculty members drawn from different schools of engineering.

5. Evaluation of the faculty presentations by the trainer on a five-point scale (Lickert Scale) for each training module and providing hints for improvement (post training).

6. Evaluation by self (i.e. faculty observing his/her own video presentation, one to one) and by peers by observing during the live presentation to the class based on a set of parameters and criteria identified.

7. Obtaining feedback on the effectiveness of the training modules and training programmes organized for continuous improvement.
3.3 LIST OF HYPOTHESES OF THE RESEARCH STUDY

The research study carried out is on: “Enhancing the effectiveness of teaching through communication skills training for engineering faculty members”.

List of hypotheses identified in this research study are:-

1. Usefulness of the training program in teaching career
2. Improvements in one’s teaching skill
3. Choosing good analogies and effectively utilizing them
4. Usefulness of the training program in enhancing one’s confidence level
5. Presenting thoughts (ideas) in a logical and methodical manner
6. Usefulness of the training program in enhancing the energy level while teaching
7. Changes required in body language
8. Ability to inspire learners
9. Specific situations when the learning will be useful
10. Making classroom interactions pleasant

The above hypotheses have been tested and an integral analysis of the impact of training program as a whole has been carried out.

3.4 RESEARCH POPULATION

Research population in this study consists of engineering faculty from across different disciplines of engineering who have undergone the specially designed ‘high impact teaching modules’ training programmes organized by the researcher during the course of three years. Total number of engineering faculty involved in this study is 600 from various disciplines of engineering (faculty from engineering colleges and technical institutions in the region 110 from different schools of engineering of the
university: 490). During the training programmes, each batch’s strength was ranging from 25 to 28. The total number of batches trained was 25.

3.5 SAMPLE SELECTION

Sample faculty involved in this research study is 144, who have responded to the questionnaires administered to them, before and after the training modules. The faculty distribution is shown in Figure 3.1

3.6 DISCIPLINE WISE DISTRIBUTION OF FACULTY SAMPLE

<table>
<thead>
<tr>
<th>Discipline/Branch</th>
<th>Number of faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronics Engineering</td>
<td>31</td>
</tr>
<tr>
<td>Mechanical and Civil Engineering</td>
<td>29</td>
</tr>
<tr>
<td>Humanities and Social Sciences</td>
<td>28</td>
</tr>
<tr>
<td>Computer science Engineering and Information Technology</td>
<td>32</td>
</tr>
<tr>
<td>Basic Sciences</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>144</strong></td>
</tr>
</tbody>
</table>

Figure 3.1. Distribution of faculty in the study

3.7 RATIONALE FOR THE SAMPLE SELECTED

All the faculty in the selected sample are engineering teachers who have masters degree in engineering and technology and all of them are pursuing Ph.D programmes in their respective engineering disciplines. They teach the subjects in English medium. Faculty members belong to the age group of 25 to 58 years; all of them have teaching experience of more than 2 years. Hence they are considered as potential sample who are motivated enough to practice some of the communication skills learnt in their own classroom settings after the training.

3.8 INSTRUMENTS USED

A proforma/questionnaire was developed for this research study for skill evaluation: collection of data and analysis. This proforma has been used for collection
of data before the training. (Appendix 1: Pre training proforma). For the assessment of overall effectiveness of training modules conducted (in respect of verbal, visual and vocal communication skills) as perceived by the individual faculty members post training. Both profomas are filled in by the participant himself/herself. Participants are encouraged to give their observations/comments in respect of other participants in the group through Appendix-3 (peer-training, skill evaluation proforma) was used

3.9 METHODOLOGY/PROCEDURE

Faculty members have been instructed to give a presentation for 3 minutes each on an idea/topic of their choice with respect to first module which is creating a positive first impression. The presentations were video graphed. The presentations were observed by the trainer as well as by other participants. Other participants (peers) used proforma; Appendix 3. Trainer gave his own observations in proforma; Appendix 4 using a 5 point Likhert scale (1 representing average and 5 representing excellent).

After the presentations, video recording of respective faculty was shown in a television (in private). The trainer has interactions with the faculty on a one-to-one basis regarding the various aspects of presentation (which is, verbal, visual and vocal communication skills). The faculty himself/herself was asked to give his/her own comments on his/her performance and views obtained as to how improvements can be made. Then the trainer offers his own comments and observations and how further improvements can be made with respect to each skill component. Simultaneously, proforma Appendix 4 was filled in. The same procedure is followed in respect of other 4 modules.

3.10 DATA ANALYSIS

The responses recorded in the proforma Appendix 4 were analyzed with respect to level of proficiency the faculty has exhibited in each of the various communication components. In data analysis both qualitative and quantitative aspects were considered and reported.