

## **CHAPTER - III**

### **RESEARCH METHODOLOGY**

#### **3.1 Definition of Research**

Best & Khan, Research in education defines ‘ as the systematic and objective analysis and records of controlled observation that may lead to the development of generalization, principles, and theories resulting in prediction and possibility ultimate control of events’.

Busha in his publications ‘ Research method in librarianship says that research is ‘ systematic quest for knowledge that is characterized by disciplined enquiring, efficient and effective approach to expand knowledge is conduct of special planned and structure investigation’.

Research to represent a critical and exhaustive investigation to discover new facts, to interpret them in the light of known ideas, theories, and laws, to revive the current laws and theories in the light of the newly, discovered facts to apply the conclusion of practical purpose.

#### **3.2 Scope of the Study**

The scope of the study is contained to use Print Media V/S Electronic Media by faculty members of the engineering colleges. Only faculty members of Gujarat are taken for conducting this study. Due to the limitation of the time, Researcher has limited his studies only the engineering colleges. The study reveals the extent use of Print media and Electronic resource media by engineering faculty members how they prefer the use.

#### **3.3 Sample size for the Study**

The collected data was taken from the engineering college of Gujarat. In the initial stage, the researcher made a list of total number faculty members of the engineering colleges of Gujarat from college website.

The questionnaire were sent through e-mail with the help of Survey Monkey Software and requesting to the respondent to fill up the questionnaire through the online link provided in the respondent email.

**Table No: 3.3.1 List of Colleges Selected for the Sample**

| No. | Name Of Institute                                      | Frequency | Percent |
|-----|--|-----------|---------|
| 1   | A. D. Patel Institute Of Technology                    | 19        | 3.6     |
| 2   | Adani Institute Of Infrastructure Engineering          | 3         | 0.6     |
| 3   | Aditya Silver Oak Institute Of Technology              | 6         | 1.1     |
| 4   | Ahmedabad Institute Of Technology                      | 3         | 0.6     |
| 5   | Apollo Institute of Engineering & Technology           | 3         | 0.6     |
| 6   | Apollo Institute Of Engineering                        | 1         | 0.2     |
| 7   | Veerayatan Institute of Engineering                    | 3         | 0.6     |
| 8   | Babaria Institute Of Technology                        | 23        | 4.4     |
| 9   | Bhagwan Mahavir College Of Engineering & Technology    | 4         | 0.8     |
| 10  | Birla Vishvakarama Mahavidayala GIA                    | 32        | 5.6     |
| 11  | Birla Vishvakarama Mahavidayala SF                     | 4         | 0.8     |
| 12  | C. K. Pithawalla College of Engineering and Technology | 12        | 2.3     |
| 13  | Chandubhai S Patel Institute of Technology             | 23        | 4.4     |
| 14  | Charotar University Changa                             | 13        | 2.5     |
| 15  | Chhotubhai Gopalbhai Patel Institute of Technology,    | 24        | 4.6     |
| 16  | Darshan Institute of Engineering & Technology          | 3         | 0.6     |
| 17  | DR. Subhash P Chavda Ahir Kelvani Mandal Group         | 3         | 0.6     |
| 18  | Engineering College Tuwa                               | 1         | 0.2     |
| 19  | G. H. Patel College of Engineering & Technology        | 25        | 4.7     |
| 20  | GIDC Engineering College.                              | 5         | 0.9     |
| 21  | Government Engineering College Valsad                  | 6         | 1.1     |
| 22  | Government Engineering College Bharuch                 | 2         | 0.4     |
| 23  | Government Engineering College Bhavanagar              | 8         | 1.5     |
| 24  | Government Engineering College Dahod                   | 5         | 0.9     |
| 25  | Government Engineering College Godhara                 | 1         | 0.2     |
| 26  | Government Engineering College Palanpur                | 2         | 0.4     |
| 27  | Government Engineering College Patan                   | 1         | 0.2     |
| 28  | Government Engineering College Rajkot                  | 16        | 3       |
| 29  | Government Engineering College Gandhinagar             | 7         | 1.3     |
| 30  | Government Engineering College Surat                   | 1         | 0.2     |
| 31  | Government Engineering College Modasa                  | 4         | 0.8     |
| 32  | Grow More Foundation Institution Himatnagar            | 1         | 0.2     |
| 33  | Gujarat Institute of Technical Studies                 | 1         | 0.2     |
| 34  | Gujarat Power Engineering and Research Institute       | 7         | 1.3     |
| 35  | Lalbhai Dalpatbhai College of Engineering              | 4         | 0.8     |
| 36  | Madhuben and Bhanubhai Patel Comm. And Technology      | 4         | 0.8     |
| 37  | Marwadi Education Engineering & Technology             | 18        | 3.4     |
| 38  | Pandit Deendayal Petroleum University, Gandhinagar     | 13        | 2.5     |
| 39  | RK University  | 12        | 2.3     |
| 40  | S N Patel Institute of Technology                      | 7         | 1.3     |

| No. | Name Of Institute   | Frequency | Percent |
|-----|---|-----------|---------|
| 41  | Sabar Institute of Technology for Girls                     | 1         | 0.2     |
| 42  | SAL College of Engineering                                  | 6         | 1.1     |
| 43  | Sal Engineering & Technical Institute                       | 9         | 1.7     |
| 44  | SAL Institute of Technology & Engineering Research          | 7         | 1.3     |
| 45  | Sardar Vallabhbhai Patel Institute of Technology            | 24        | 4.6     |
| 46  | Sarvajanik College of Engineering & Technology              | 26        | 4.9     |
| 47  | Shankersinh Vaghela Bapu Institute of Technology            | 3         | 0.6     |
| 48  | Shantilal Shah Engineering College                          | 14        | 2.7     |
| 49  | Shree Swaminarayan Institute of Technology                  | 2         | 0.4     |
| 50  | Shri Labhbhai Trivedi Institute of Engineering & Technology | 10        | 1.9     |
| 51  | Shri S'AD Vidya Mandal Institute of Technology              | 4         | 0.8     |
| 52  | Shri.Swami Atmanand Saraswati Institute of Technology       | 16        | 3       |
| 53  | Shroff S R ROTARY Institute of Chemical Technology          | 20        | 3.8     |
| 54  | Sigma Engineering College Matar                             | 3         | 0.6     |
| 55  | Sigma Institute of Engineering                              | 6         | 1.1     |
| 56  | Smt. S. R. Patel Engineering college                        | 1         | 0.2     |
| 57  | The Maharaja Sayajirao University of Baroda.                | 10        | 1.9     |
| 58  | Universal College of Engineering & Technology               | 1         | 0.2     |
| 59  | Valia Institute of Technology                               | 3         | 0.6     |
| 60  | VENUS International College of Technology                   | 5         | 0.9     |
| 61  | Vishwakarma Government Engineering College                  | 22        | 4.2     |
| 62  | Vyavasayi Vidya Pratishthans Sanch College                  | 4         | 0.8     |

Table 3.3.2 shows the sex wise Distribution from Male and Female Category of data collection, which is given as under:

**Table No: 3.3.2 Sex Wise Distribution of the Sample**

| No           | Sex    | Number of Faculty Members | Percentage   |
|--------------|--------|---------------------------|--------------|
| 1            | Male   | 363                       | 68.9         |
| 2            | Female | 164                       | 31.1         |
| <b>Total</b> |        | <b>527</b>                | <b>100.0</b> |

Table.3.3.3 shows the survey population taken as per users'. There were 527 filled response received from the category of Professor, Associate Professor, Assistant Professor.

**Table No: 3.3.3 Designation Wise Distribution of the Sample**

| No           | Designation         | Number of Faculty Members | Percentage   |
|--------------|---------------------|---------------------------|--------------|
| 1            | Professor           | 31                        | 5.9          |
| 2            | Associate Professor | 64                        | 12.1         |
| 3            | Assistant Professor | 432                       | 82.0         |
| <b>Total</b> |                     | <b>527</b>                | <b>100.0</b> |

A few common disciplines among selected engineering college had been taken for Data collection, which is given as under:

**Table No: 3.3.4 Department Wise Distribution of the Sample**

| No           | Department of Colleges                  | Number of Responses | Percentage   |
|--------------|---|---------------------|--------------|
| 1            | Aeronautical Engineering                | 1                   | 0.2          |
| 2            | Applied Science And Humanities          | 11                  | 2.1          |
| 3            | Architecture Engineering                | 1                   | 0.2          |
| 4            | Automobile Engineering                  | 3                   | 0.6          |
| 5            | Biomedical Engineering                  | 2                   | 0.4          |
| 6            | Biotechnology                           | 1                   | 0.2          |
| 7            | Chemical Engineering                    | 25                  | 4.7          |
| 8            | Civil & Infrastructure Engineering      | 3                   | 0.6          |
| 9            | Civil Engineering                       | 104                 | 19.7         |
| 10           | Computer Engineering                    | 56                  | 10.6         |
| 11           | Computer Science & Engineering          | 3                   | 0.6          |
| 12           | Electrical & Electronics Engineering    | 3                   | 0.6          |
| 13           | Electrical Engineering                  | 58                  | 11.0         |
| 14           | Electronics & Communication Engineering | 60                  | 11.4         |
| 15           | Electronics Engineering                 | 6                   | 1.1          |
| 16           | Environmental Engineering               | 1                   | 0.2          |
| 17           | General                                 | 16                  | 3.0          |
| 18           | Industrial Engineering                  | 2                   | 0.4          |
| 19           | Information Technology                  | 31                  | 5.8          |
| 20           | Instrumentation & Control Engineering   | 13                  | 2.5          |
| 21           | Marine Engineering                      | 1                   | 0.2          |
| 22           | Maths                                   | 15                  | 2.8          |
| 23           | Mechanical Engineering                  | 103                 | 19.5         |
| 24           | Mechatronics                            | 2                   | 0.4          |
| 25           | Metallurgical Engineering               | 1                   | 0.2          |
| 26           | Physics                                 | 2                   | 0.4          |
| 27           | Production Engineering                  | 2                   | 0.4          |
| 28           | Textile Technology                      | 1                   | 0.2          |
| <b>Total</b> |   | <b>527</b>          | <b>100.0</b> |

### **3.4 Preparation of Questionnaires**

With the help of Survey Monkey software the researcher has prepared the online questionnaire form. The online questionnaire was available through the web link and sent to the selected respondent through email.

### **3.5 Selected survey monkey.com for creation of questionnaire**

In the market, the number of professional online survey companies have provided services to researchers for the collection of data. The researcher has selected the Survey Monkey software to collect the data from the respondents.

Initially, the researcher has made the login into the free trial version of survey monkey and got the information about the different functions of options for designing the question.

### **3.6 Selection of standard package from different options in survey monkey**

The Survey Monkey has given space for putting him to an online questionnaire of the Researcher. In this package they will provide the following options to the researcher.

- 1 Unlimited number of Surveys.
- 2 Unlimited Questions per Survey.
- 3 24 X 7 Customer support via emails.
- 4 Quizzes with custom Feedback.
- 5 Unlimited filters & Cross Tables, Trended Data.
- 6 1000 responses for the month.
- 7 Data Export (CSV, PDF, PPT, XLS).
- 8 Text Analysis.
- 9 Skip Logic Only.
- 10 Custom Logo, Colours & Survey URL.

With the help of Guide and Professional colleagues, the researcher has designed the questionnaire in the SurveyMonkey.com website.

The researcher has created the questionnaire as per the requirements of options like single choice, multiple choice and descriptive choice etc.

### **3.7 Trial questionnaire prepared by the researcher**

The trial questionnaire was prepared by the researcher and its implementation. The researcher has prepared the dummy survey questionnaires to check if all the functions will work properly or not.

The different types of question are prepared as per the single choice, multi-choice option and descriptive.

The dummy questionnaire were sent to the ten respondents of the professional, senior librarian and faculty member of engineering college.

All the ten dummy respondent has filled up the necessary all the details of the questionnaire and checks the function of all the questions of the survey.

### **3.8 Pilot Study**

The questionnaire was tested with ten respondents. The researcher has also sent the forwarding letter mentioned that it is a pilot study and requested that if any updating in the questionnaire. Please inform by email or telephone. So, the researcher can be updated and reframed the questionnaire.

### **3.9 Pilot Studies Reformed**

From the pilot study, the two respondents have given their suggestion about the questionnaire in two question. In question no 1 if the name is optional rather than mandatory. So, the researcher can be got maximum response because there are some respondent who wants to hide their name because of policy of the management. The question no 11 & 12 are asking about the accessibility and suitability. So both the question should be merged in the same table. So, the respondent can save the time for filled up the questionnaire.

After the suggestion, both questions the researcher has reformed the survey form with the permission of the guide and finalized the questionnaire form. The researcher has sent the email to all the respondent with forwarding letter for requesting to please fill up the survey form ant this study is only for the educational purpose only.

### **3.10 Data Collection**

The total 62 institute were selected for this study. The researcher has sent the email through survey monkey link and the requested to respondents to fill up the survey in the web link provided into your email address.

The researcher has sent the frequently first reminder after one month and frequently reminder three times duration after the month end and requesting the respondent to please fill up the survey form.

The researcher has also identified the respondents who have to fill up the partial survey form. So, the researcher has personally requested him to filled up the whole survey and number of respondent have fill up the whole survey.

There are 12 (Twelve) survey was filled up partially. Researcher has requested to the respondent but the closing of the online survey they are unable to fill up the whole survey. So, the researcher has identified the survey form and deleted the partial form. So, it is not included into the data collection of this survey.

The researcher received total number 527 respondents out of approximately 2500 respondents. The response rate of 21 percent over the period of the survey.

### 3.11 Data Analysis

The data collected in the survey monkey software can be saved in the CSV file format and with the help of SPSS Software, it can be analysed.

All the question are categorise as per Table No: 3.11.1.

**Table 3.11.1 Types of Questions**

| No | Type of Question       | Question No.                              |
|----|------------------------|---|
| 1  | Open ended Question    | 1,2,3,20,21,22                            |
| 2  | Single Choice Question | 4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19 |

The completion of all steps like creation online questionnaire after the Pilot Study. The actual data was collected and it can be analysed with statistical tools. The structural methods like frequency distribution with percentage, Chi-square test, ANOVA Test, T-Test and F-Test were used for this study.

**Table 3.11.2 Data Analysis Tools**

| No | Tools             | Functions  | Uses   |
|----|-------------------|--|--|
| 1  | ANOVA             | The Anova tools provide different variance types of variance analysis                                    | Test of the hypthotheses that each sample is drawn from the same underlying probability distributions.                             |
| 2  | F Test            | Performs a two sample F-Test to compare two population variance.   | Test that these two samples come from the distribution with equal variance.  |
| 3  | T-Test / Z - Test | Determine whether the two samples are likely to have come from distribution with equal population means. | Compare two population means when the population variance is known and shown.  |
| 4  | Chi Square Test   | The variance is not the only thing for which you use a Chi-square test for.                              | The chi-square statistic may be used to test the hypothesis of no association between two or more groups, populations, or criteria |

### **3.12 Data Presentation**

The data can be presented in the form of tabular / graphical form represented where it requires. The details analysing and interpretation of the chapter in the next chapter.

### **3.13 Citation Style**

Providing references to support the statements given in the research work is an important part of any study, but all these references should be appropriately acknowledged. Forging references in the present work ‘American Psychological Association’ 6th edition has been followed with the help of Mendeley Desktop reference management software.

## REFERENCES

1. Best, John W and Kahn James V.(1999). Research in Education. 2<sup>nd</sup> ed. New Delhi: Prentice Hall of India.
2. Busha, Charles H and Harter, Stephen H(1988). Research Methods in Librarianship: Techniques and Interpretations. New York: Academic Press.
3. Kiess, H.O.(1989), Statistical Concepts for the Behavioural Science. Boston: Allyn and Bacon.
4. Kumar, P.S.G (2004) Research Methods and Statistical Techniques Delhi: B.R.Publishing, p.p. 243-248.
5. Microsoft office Excel 2003. Help Documentation
6. Singh, S.P. Research Methods in Social Sciences: A Manual for Designing Questionnaires, New Delhi: Kanishaka Publishers. P.p. 268.
7. SPSS for Windows Release 11.0 Help Documentation.