Research Methodology
CHAPTER 4
RESEARCH METHODOLOGY

INTRODUCTION
Methodology is the science of understanding the methods or principles of procedure to be adopted. It is the science of proper modes and orders of procedures. To find out a solution for any problem, the researcher should adopt suitable method in connection with the objectives of the study. It mainly depends upon the nature of the problem and the type of data required to arrive at appropriate solutions. The selected method should always be appropriate for the problem under investigation, feasible, pre-planned, well understood and clearly defined. The present study had been structured to document the prevalence of Impact of Training on Informational Technology Professional with special reference to Chennai, Bangalore and Madurai cities. Specifically, this chapter of the study discusses the overall research methodology consists of Variable/factors, Research Objectives, construction of questionnaire and its validation process, sample methods and size, sources of data, pilot study etc.,

4.1 Factors and Variables Used in the Research Questionnaire

After careful exploration of the Literature, the factors contributing to the occurrence of Impact of Training on the Information Technology Professional were reviewed. All the factors responsible were grouped into nine categories based on the homogeneity of the variables studied. The Nine factor studied includes: (i) Types of Training; (ii) Learners Reactions; (iii) Training methods with learning behaviour Training; (iv) Before Training Job performance; (v) After Training Job Performance; (vi) Women Training and Leadership; (vii) Job Rotation in IT companies; (viii) Training for New Joiners; (ix) Results of Training (After Training the productivity increases). Under each factor several relevant variables were included to capture the key issues influencing the Impact of Training in Information Technology industry.

The Following are some of the relevant and contributing factors related to Impact of Training on IT employees and each factor consists of many variables that are known to be contributing to Training in IT industry.
4.1.1. Types of Training

The types of training consist of the following which includes Dr Donald Kirkpatrick's model.

The variables studied include the following kinds of training.

i. Reaction Training
ii. Behaviour Training
iii. Online Learning
iv. Result oriented Training

4.1.2 Learners Reaction

Evaluation of internal and training, on:

i. How many of your knowledge workers participated in training over the last 12 months
ii. What is the average number of hours or days spent by a IT worker in any training program
iii. What kind of training your company provide in IT for knowledge workers
iv. What is the mechanism for evaluating the effectiveness of training on your IT worker productivity level
v. How relevant you found the training for your work.

4.1.3 Training methods with Learning behaviour Training

i. My company organize frequent training
ii. Manpower Turnover in my company is reduced due to frequent Training
iii. Training given by my company is related to my current requirement
iv. Training is given to maintain the company data in a proper manner
v. My company uses ERP training
vi. Rate your success of implementing on your actions/Job
vii. To what level, have you been able to use knowledge you gained at your workshop?
viii. I am able to satisfy the conflicting demand of various people above me
ix. I do not lack necessary software facility needed to carry out different varieties of tasks I should have given more attention to the development of skills which I need

4.1.4 Afore Training Job performance

i. As a result of the programme, how would you rate you changes in attitude towards your job?

ii. What are the changes in behaviour

iii. What level of practical application have you been able to achieve

iv. Have you noticed any changes in the behaviour of those around you

v. Indicate the amount of effort made to improve relations with other departments?

4.1.5 After Training Job Performance

i. The Managerial skills improved after training?

ii. The training had impact on the knowledge of the participant in IT

iii. The training helped identify role of specific IT skills needed in companies

iv. Training improved the interpersonal relations

v. Training achieved the Goals set by the Management

vi. Training conveyed the RAT (Role, Analysis and Techniques)

vii. Training full fills the Mission of the Management

viii. Enhancing the training to change the attitude of the employee

ix. Is there a noticeable and measurable change in the activity and performance of the trainee when back in their role?

x. Would the trainee be able to transfer their learning to another person?

xi. Is the trainee aware of their change in behaviour, knowledge, or skill level?
4.1.6 Women Training and Leadership

i. A worker can achieve more when women take up leadership

ii. Training women is tougher than training men

iii. Training men is tougher than training women

iv. Training changes the style of leadership of an individual

v. Training can instil a transformational leadership style

vi. Time management is instilled in Training

4.1.7 Job Rotation in IT companies

i. High attrition rate in IT industry is due to lack of training

ii. IT people are able to get job very easily and so switch jobs frequently?

iii. Knowledge worker needs training

iv. Training increases productivity of knowledge workers.

v. Training helps proper utilization of a person’s resources

vi. Online training is very effective (video/Lecture/Text/ERP/SAP)

4.1.8 Training is required for New Joiners

i. New joiners need training

ii. New joiners depend upon training to be able to join others at work.

4.1.9 Result oriented (After Training the productivity increases)

i. What kind of informal training does your company provide for knowledge workers

ii. What is the mechanism for evaluating the effectiveness of training

iii. Can you specify the total number of training you had in the last 12 months

iv. Did the training take place during working time

v. How many skills you learned through training

vi. My company engaged foreign companies/trainers in the past
Are there any differences on the training provided by a foreign employers and Indian Employers?

4.2. Research Design

A research design is the arrangement to collect and analyse data in the light of the research purpose, namely Training Evaluation. The researcher has applied descriptive research design which attempts to describe, explain and interpret conditions of the present. The purpose of a descriptive research is to examine a phenomenon that is occurring at a specific place(s) and time. A descriptive research is concerned with conditions, practices, structures, differences or relationships that exist, opinions held, processes that are going on or trends that are evident.

4.3 Data Collection

The study is based on the survey from the employees of major IT companies working in Chennai, Bangalore, and Madurai. The data required for the research purpose was obtained from both primary and secondary sources.

4.3.1 THE PRIMARY SOURCES

The principal data was collected from the 400 respondents; the researcher used 30 questionnaires for pilot study, to check the reliability, and validity of the instrument by applying Cronbach’s alpha and F test.

4.3.2 THE SECONDARY SOURCES

Information related to Training were collected from various Literatures, and various secondary sources. Information was collected from:

- Newspapers and Magazines
- Company Literatures
- Reports and Publications of National and International organisations.
- Reports of IT companies.
- Various Research Journals & Periodicals.
- Various websites on Internet.
- E journals and reports available on Internet.
4.3.3 Period of Study

Sample and data for the study were collected during February 2011 to July 2012 from the respondents directly. After serious discussion with the Human Resources Managers, IT/ITES sector experts, Industrial Training Consultant, Training specialist.

4.4 Pilot Study

The pilot study report provides information about the trail survey from 30 Respondent. Pilot study tested the reliability and validity of the instrument, confirming the robustness of the instrument for conducting research, determining the sample size required for the research study, and finally to confirm the research model proposed to use for further research.

**Reliability Statistics for the impact of Training in IT industry of the worker**

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.774</td>
<td>.768</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Primary Data

The Cronbach’s alpha test used to assess the reliability of the tool being used to analyse the answer from the respondents. Six functional variables were used to assess the reliability. Minimum reliability for the instrument is required most.6 to.8 for attaining minimum reliability. This study has 0.768 alpha (i.e., 76.8% of reliability) values. This explains that this construct attained the minimum standard in reliability.

4.5. Sampling Design

Sampling design is a design, or a working plan, that specifies the population frame, sample size, sample selection, and estimation method in detail. Objective of the sampling design is to know the characteristic of the workers of the IT Companies. The researcher has handed over the questionnaires to IT companies on random basis. The representative sample respondent has been contacted by field investigator under the supervision of researcher. Emails have been sent to some respondents who were busy.
4.5.1 SAMPLING UNIT:
Researcher has selected five major IT companies

1. TCS
2. Infosys
3. K7 computing Antivirus
4. Honey well
5. AJ squares

4.5.2 SOURCE OF DATA:
Data for this research survey has been gathered from the respondents after the working hours.

4.5.3 Sampling frame:
The researcher collected the list of employees from the concern manager with the prior permission of the HR Manager in these 5 companies.

4.6 Sample Size Determination
NATURE OF UNIVERSE: basically universe for this study is heterogeneous in nature. In this study the respondents are from different department of IT companies placed in Chennai, Bangalore, and Madurai.

4.7 Sample Size Calculation: Sampling error can be controlled by selecting adequate size. In this case researcher desired s precision of ± 5 i.e. the true values mean not less than 95%. Researcher accepts that the acceptable rate of error (e) is equal to 5%. The employees working in the IT companies selected for the study were 2949.
Researcher uses the following formula for deciding the required sample size for this study.

\[(n-1) \times (z^2 \times \sigma^2)/(((n-1) \times e^2)+z^2 \times \sigma^2)\]

Here, \(n\) = size of the sample

\(z\) = the value of standard variate at a given confidence level. Here the confidence level is 95% and assumed to be a normal distribution. So, the table value under normal curve is 1.96.
\(e\) = acceptable error
σ_p = Standard deviation of the population calculated by taking functional variables of the respondents as the key source for deciding sample size.
Hence, the sample size required for this study is
= \frac{(3.8 \times 0.30 \times 2949)}{(2949 \times 0.0023)+(3.84 \times 0.30)}
= \frac{(3.84 \times 0.30)}{(0.0025)}
= 3397.25/(7.37+1.15)
= 398.73

So, 400 respondents are required for this present study, finally, researcher decided to take over the lower limit of the sample size as **400 samples**

### 4.8 Sampling Plan

Sampling plan for this has given below:

I. **AJ squares**

   Cities : Madurai, Chennai
   No of Respondents : 110

II. **TCS**

   Cities : Bangalore, Chennai
   No of Respondents : 90
III. **Infosys**

Cities : Bangalore, Chennai  
No of Respondents : 80

IV. **K7computing Antivirus**

City : Chennai  
No of Respondents : 75

V. **Honeywell**

Cities : Bangalore, Chennai, Madurai  
No of Respondents : 45

Classification of respondents based on the city where the IT companies are situated

<table>
<thead>
<tr>
<th>City</th>
<th>IT Companies</th>
<th>Size</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madurai,Chennai</td>
<td>AJ Squares</td>
<td>110</td>
<td>27.5</td>
</tr>
<tr>
<td>Bangalore, Chennai</td>
<td>TCS</td>
<td>90</td>
<td>22.5</td>
</tr>
<tr>
<td>Bangalore, Chennai</td>
<td>Infosys</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>Chennai</td>
<td>K7Computing Pvt. Ltd.</td>
<td>75</td>
<td>18.75</td>
</tr>
<tr>
<td>Bangalore,Chennai, Madurai</td>
<td>Honey Well</td>
<td>45</td>
<td>11.25</td>
</tr>
<tr>
<td><strong>Total No of Respondents</strong></td>
<td></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
4.9 Sampling Technique
Quota sampling was applied in this study. Researcher decided to collect data from the selected IT offices located in Chennai, Madurai and Bangalore. Researcher decided to allot sample size for each IT offices based on the level of accessibility. Hence researcher decided on quota sampling as appropriate to get the response from the respondents.

4.10 Research Tools
To arrive at the result of the study, the data was analyzed using SPSS. The Tools used for the analysis include Levene’s statistics, Anova Test, and Structural Equation modelling to study the Impact of Training in IT Industry. These tools are explained as under

4.10.1 CRONBACH’S ALPHA
In statistics, Cronbach's alpha is a coefficient of internal consistency. It is usually employed as an approximation of the reliability of a psychometric test for a sample of examinees. It was first named alpha by Lee Cronbach in 1951, as he had meant to go on with further coefficients. The measure can be seen as an annex of the Kuder–Richardson Formula 20 (KR-20), which is an equivalent measure for dichotomous items. Alpha is not robust against missing data. Several other Greek letters have been utilized by later researchers to designate other measures used in a similar setting. Slightly related is the average variance extracted (AVE). Cronbach's alpha statistics is widely applied in the social sciences, business, nursing, and other fields. The term item is applied throughout this article, but items could be anything — questions, raters, indicators — of which I might ask to what extent they "measure the same thing." Items that are manipulated are commonly consulted to as variables. The theoretical value of alpha varies from zero to 1, since it is the ratio of two divisions.

4.10.2 LEVENE'S TEST
Some of the procedures typically assuming homoscedasticity, for which one can use Levene's tests, include analysis of variance and t-tests. Levene's test is often used before a comparison of substance. When Levene's test shows significance, one should switch to generalized tests, free from homoscedasticity assumptions. Levene's test may also be utilized as a main test, for answering a stand-alone question whether two sub-samples in a given population have equal or different variances.
4.10.3 ANOVA
Analysis of variance is the statistical technique used to measure the mean differences between the variables and used to find out or prove the hypothesized relationship between the variables that exist.

4.10.4 REGRESSION ANALYSIS & AMOS (ANALYSIS OF MOVEMENT OF STRUCTURE)
Regression analysis was used to formulate a model for predicting Training and Development in IT industry. Within the framework of Consumer self-confidence measured used to evaluate the brand equity dimensions in Banking industry dimensions are have number of variables which are scope studying its causational effect on the sustainability of Banking industry.

Using the regression model it was proposed to construct a model. The general regression model (linear) is of the type: \( Y = a + b_1X_1 + b_2X_2 + \ldots + b_{15}X_{15} \), where \( y \) is the dependent variable, and \( X_1, X_2, \ldots, X_{15} \) are the independent variables expected to be related to \( y \) and expected to explain or predict \( y \), and \( b_1, b_2, b_3, \ldots, b_{15} \) are the coefficients of the respective independent variables, which will be determined from the input data.

4.11 Limitations
The present investigation, through carried out on scientific lines, suffers from following limitations

1) The Study cannot be generalized to all IT companies because the findings were based on the responses given by respondents living in Chennai, Bangalore, and Madurai
2) The study is a periodic study so it suffers from period limitation; that is, the opinion of the respondents may vary over a period of time.
3) It is contemplated to have a sample size of 400 sample units only, the above limitations will in no way affect the validity of the findings of the study, and care has been taken to have a representative sample.