CHAPTER: 3
RESEARCH METHODOLOGY

3.1 Introduction

The training is the keystone of sound human resource management as it makes personnel more effective and prolific. As a contrivance, the training fills the gap ubiquitous to update knowledge, technology and skills. Being an asset of any organization the employees are the key to unlock tomorrow’s opportunities and investing in them at every level pays off myriad ways to organisations. It has been established by many researchers that training is dynamic in its nature. By the time the training has not only got importance due to its impact on the performance of employees but also on the overall organizational operations. The training programs enable employees to develop and strengthen their skills, knowledge and abilities that they need or should improve upon. It helps reduce weak links and ensure the same mistakes are not repeated. In the increasingly competitive environment, the organizations will win which will invest in training. Training is not a luxury but necessary for companies which wish to participate and sustain globally. Through training employees may get new ideas, learn improved practices, update skills, avoid mistakes and enhance their knowledge which helps them to put into practice in their jobs.

The training has an intense effect on employee attitude, behaviour, learning and overall performance. Continuous training programs empower employees and make them feel more valued. They feel appreciated, challenged and more satisfied towards their jobs and objectives. It gives them the confidence that they are abreast of the new developments and have a stronger understanding of the industry. This confidence pushes them to perform better and think of new ideas to excel. Increase in employee performance leads to increase in organizational productivity. A team of competent and knowledgeable employees is all that a company needs to compete successfully and hold a strong position in the industry. The training programs have a constructive impact on the organization and that’s why it has
become a strategic priority in the organizations and being implemented in a thoughtful and deliberate manner to produce targeted and tangible results for the business.

3.2. Statement of the problem

The Oil Industry in India however having millions of employees still require thousands of skilled people to work in highly crucial sector and the people who are working in this sector need to update themselves with latest technology and new skills because change in technology and innovations in this sector are spontaneous. Due to frequent changes and innovations, existence of gap in expected and actual performance of employees is implied. To reduce this gap imparting new skills and update the employees for better performance through training play a pivotal role. The oil companies are now struggling to equip their people with the critical capabilities and skills they need to succeed. The ongoing requirement to train people is driven by the talent crunch and the changing needs and expectations of the workforce. The oil and gas industry is a volatile one and faces lot of problems like- talent shortage and talent attraction. With the growing number of projects, the oil and gas companies have created a plethora of new job opportunities but face shortage of experienced professionals. The oil and gas industry require highly skilled professionals, so old and new professionals have to undergo a bundle of trainings regularly.

The Global Energy Talent, which provides skills and expertise for the oil and gas sector, has reported that there will be a 38% shortage in the influx of talented engineers. Most of the current workforce who is highly skilled is nearing retirement age. So there will be a huge pressure on the HR managers to replace these ageing professionals who had been the backbone of most companies. In the next five years there would be a significantly shortage in experienced talent in the sector due to these retirements and making it a terrifying thing for the HR. The present research study is focussed on knowing the impact of training practices of oil companies on performance, behaviour and learning of employees of these companies.

3.3. Objectives of the Study:

The present research is aimed to achieve the following objectives:

I. To study and make comparison of the training practices being followed by selected public and private oil companies in India

II. To know the opinion of employees about training practices in select public and private oil companies

III. To compare and analyze the impact of training on learning, behavior and performance of employees in public and private oil companies
IV. To suggest measures to overcome shortcomings in training practices being prevalent in these companies

3.4. Hypotheses of the study

On the basis of research objectives articulated here above, the research hypotheses developed are mentioned below as:

H$_1$: There is a significant difference in the opinion of executive and middle level employees regarding training practices being followed by the selected oil companies.

H$_2$: There is a significant difference in the impact of training on learning outcome of employees in public and private sector oil companies in India.

H$_3$: There is a significant difference in the impact of training on behaviour of employees in public and private oil sector companies in India.

H$_4$: There is a significant difference in the impact of training on performance of employees in public and private sector oil companies in India.

3.5. Rationale of the Study

The oil and gas sector plays a key role in economic development of India. The demand for oil and gas is projected to grow further providing vast opportunities for investment (Source: Petroleum Federation of India). India’s oil and gas sector will require 25,000 additional professionals in the next five years due to business growth and retirement or attrition in the sector. This is equivalent to around 48% of the current employee strength (Source$^1$). The Republic of India is the sixth largest consumer of oil in the world and the ninth largest crude oil importer. The country’s oil and gas sector contributes over 34.4% to the Gross Domestic Product (GDP). However, due to huge demand-supply gap in oil and gas in India, it imports more than 60% of its crude oil requirement. Further, oil consumption in India is projected to enhance nearly 5.2% by 2025 (Source$^2$).

The immensity of this sector is substantiated by the fact that there were a total of 136347 people employed in the petroleum industry in FY 2013 and now further increased (source: ibef.org). Around 50% of employees have more than 20 years of experience, and the majority is due to retire in the next 5–10 years. The Government has taken many initiatives to boost investment in this sector, like- 100% FDI is allowed for Indian companies in refineries, 100% FDI is allowed for petroleum products and pipeline sector, natural gas and for infrastructure related to petroleum products marketing.

$^1$ Report on Ernest and Young’s Manpower demand and supply study for oil and gas sector, 2009
$^2$ Ministry of Petroleum and Natural Gas, Government of India
At the other end, there is a shortage of manpower especially expert/scientist in the country to carry out Research and Development (Source\(^3\)). There are few points which establish grounds for study on training and employee performance in this sector.

1. There is a shortage of talent. The skills sets in this industry are highly specialized and difficult to develop and acquire (Source: The ET Oil and Gas Summit, 2017).

2. Oil and gas companies should create and implement relevant training and skill development programs that would not only help retain the current workforce but also rope in fresh talent. This would enrich the oil and gas companies to result in consolidation of the industry (Source: 15\(^{th}\) Oil and Gas HR Round Table on 26 August, 2016, Mumbai).

3. Non- availability of quality manpower, technical incompetence and high rate of attrition in oil PSU’s and skill shortage (Source: Strategic plan for 2011-17, Ministry of Petroleum and Natural Gas, Government of India).

4. The oil and gas sector is facing challenges regarding the availability of a well-trained and capable talent pool, primarily due to lack of awareness and certain negative perceptions about the oil and gas sector among the students, parents and counselors (Kelkar Committee Report on Roadmap for reduction in Import dependency in the Hydrocarbon Sector by 2030).

5. India’s oil and gas sector is facing a major talent shortage that can potentially affect its ability to operate and grow. The sector is facing challenges in terms of high attrition rate, ageing workforce, inability to attract new talent and unavailability of skilled workforce for both core and outsourced operations (Hydrocarbon Sector Skill Council, 2014).

6. India is the second largest emerging economy and there is an urgent need of enhancing job quality and improve the skills and capabilities of employees. (Source: India Labor and Employment Report, 2014).

7. Almost 11% of current workforce in PSUs is estimated to be retiring in five years. It is also anticipated that the sector will witness 34% retirement at the middle level management, which implies a significant loss of experience. Therefore the industry requires a trained and competent manpower at all levels in an organization. (Source: Report on HR challenges in the Indian oil and gas sector, 2010).

\(^3\) Report of Working Group on Petroleum and Natural Gas sector for 12\(^{th}\) five year plan 2012-17
8. Existing academic institutes are not sufficient to ensure industry stability in terms of manpower supply. The gap between the demand for trained manpower and its supply is widening annually. Some of the key issues include an ageing workforce, retirement, attrition and talent acquisition and supply. (Source: Report on HR challenges in the Indian oil and gas sector, 2010).

9. The energy industry works to attract the next generation of energy professionals and helps develop their skills and capabilities by the way of training to meet the challenges of future (Source: Report on skills needs in the energy industry, Jan. 2008).

It is wrap up from above points that there is insistent requirement to conduct a study on the training practices and its impact on employees’ attitude, behaviour and ultimately on their performance. The success or failure of oil companies solely depends on the performance of employees. When the employees are properly trained, they feel motivated and perform their task with full zeal and zing, which ultimately lead to fetch positive returns for the company. Even the expenditures incurred on training materialize into high profits. So, taking a note of the review of literature, excerpts from reports on oil sector and opinion of experts in this field, it becomes necessary to conduct a deep study on this sector particularly focussed on the training and its impact. It is essential to know the prevailing training practices in this sector and whether the employees are getting any benefit out of such training and which ultimately fruitful for oil companies.

3.6. Research Design

The research design refers to the overall strategy that the researcher chooses to integrate the different components of the study in a coherent and logical way, thereby ensure that the research problem will be addressed effectively. The present study is having the features of descriptive, exploratory and analytical research which makes it a hybrid type of research in which primary as well as secondary type of data is used.

3.7. Sources and Type of data

In the present study, both primary and secondary sources of data collection have been utilized. As questionnaire is treated one of the most reliable and valid technique for collecting the data, the primary data is collected through the questionnaire focusing on the opinion of employees regarding training, impact of such training on learning outcome, behavioural changes and on employee performance. The present questionnaire is inspired from Kirkpatrick Model, but considering the objectives in mind some more statements are added
in the questionnaire. Mr. Donald Kirkpatrick has developed a very popular evaluation model that has been used since the late 1950s by the training community. The focus of this is on measuring four kinds of outcomes that should result from a highly effective training program. Kirkpatrick’s model includes four levels or steps of outcome evaluation: Level 1 Evaluation—Reaction, Level 2 Evaluation—Learning, Level 3 Evaluation—Behaviour, Level 4 Evaluation—Results.

The questionnaire was administered through electronic mail and personal delivery. One common questionnaire was used for middle and executive level employees of oil Industry. The reliability of the questionnaire is assessed using Cronbach Alpha. Secondary data consist of information that already exists somewhere, having been collected for some other purpose. In this study secondary data was collected from a thorough review of Empirical and Theoretical Literature, Management and Quality Journals, Reports of Governmental Agencies, Business Magazines, Newspapers, Company Reports and Websites. The time period considered for collection of data was from the year 2010-11 to 2016-17. The entire questionnaire is divided into four parts; opinion of employees regarding training, impact of training on learning outcome, impact of training on behavioural changes and impact of training on employee performance a detailed copy of questionnaire is available in Annexure.

Multiple choice questions were equipped with 3 point Likert Scale so the respondents would indicate the intensity of their insight on the type of training provided to them and it impact on their performance. The respondents were asked to rate opinion statements according to their level of agreement with it by using a 3-point Likert scale (1: Disagree, 2: Neutral, 3: Agree) and impact on training statements by using a 3- point Likert scale (1: Always, 2: Neutral, 3: Sometimes). The questionnaire was discussed with Research Guide number of times to give it a proper shape and make it simpler and eloquent to get the maximum statistics. The responses of employees and top level management towards the selected attributes marked the Impact that training created in their performance.

Table 3.7 Showing the Section wise Reliability Scores for the Questionnaire

<table>
<thead>
<tr>
<th>Section</th>
<th>Particulars</th>
<th>No. of statements</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A</td>
<td>Opinion regarding training and its impact</td>
<td>17</td>
<td>0.999</td>
</tr>
<tr>
<td>Part B</td>
<td>Impact of training on learning outcome</td>
<td>9</td>
<td>0.998</td>
</tr>
<tr>
<td>Part C</td>
<td>Impact of training on behavioural changes</td>
<td>12</td>
<td>0.999</td>
</tr>
<tr>
<td>Part D</td>
<td>Impact of training on employee performance</td>
<td>21</td>
<td>0.999</td>
</tr>
</tbody>
</table>
3.8. Sampling and Sample Design

A sample of 500 employees was selected from oil companies to conduct present study. The target employees were the officers working in various capacities like (officers, senior officers, deputy managers, managers and senior managers). The employees were divided into three levels i.e. executive level, middle level and top level. The employees were divided into levels on the basis of their designation and experience. Executive level employees have experience ranging from 0 to 13 years. The middle level employees have experience ranging from 13-19 years. The executive level employees include officers, senior officers and deputy managers. The middle level employees include managers and senior managers.

As the sector is very wide therefore the study is constrained to use Convenient Sampling and data on questionnaire is collected on a random basis to approach the organizations. The data from IOCL company has been collected from Regional office, Chandigarh; Panipat Refinery and from IOCL depot in Rewari. From BPCL Company, data has been collected from Regional office, Chandigarh; from BPCL Lalru plant and from BPCL Depot in Rewari; and also there are some online responses from Bina Refinery in Gujrat. In order to collect data from HPCL Company, the Regional office, Chandigarh, HPCL Depot in Rewari were contacted/targeted and many responses were received from Bhatinda and Mathura plant. For RIL and Essar Oil data has been collected from their depots in Rewari (Haryana).

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of the Company</th>
<th>Questionnaire Distributed</th>
<th>Questionnaire Returned</th>
<th>Total Questionnaire Selected</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Middle</td>
<td>Executive</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>HPCL</td>
<td>100</td>
<td>29</td>
<td>65</td>
<td>94</td>
</tr>
<tr>
<td>2.</td>
<td>IOCL</td>
<td>100</td>
<td>10</td>
<td>64</td>
<td>74</td>
</tr>
<tr>
<td>3.</td>
<td>BPCL</td>
<td>100</td>
<td>13</td>
<td>65</td>
<td>78</td>
</tr>
<tr>
<td>4.</td>
<td>RIL</td>
<td>100</td>
<td>7</td>
<td>52</td>
<td>59</td>
</tr>
<tr>
<td>5.</td>
<td>Essar Oil</td>
<td>100</td>
<td>9</td>
<td>42</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>500</td>
<td>68</td>
<td>288</td>
<td>356</td>
</tr>
</tbody>
</table>
In totality, out of 500 distributed questionnaire 356 questionnaire (i.e. 71.2%) have been selected which were completely filled in and found accurate to be considered. The lowest number of questionnaire was received from Essar Oil, i.e. 51 and highest number from HPCL, i.e. 94 questionnaires.

3.9. Data Analysis Tools and Techniques

Without proper data analysis, it becomes difficult to interpret and draw some results. Without having results objectives can’t be attained. Through statistical/analytical tools and techniques pulverization of data can be done to have requisite results. In the present study, the presentation of data is made in the tabular as well as graphical form to have better understanding. The primary data is analysed through some important statistical tests namely, Rank Mean, Percentage Analysis, t-test, ANOVA.

A. Rank Mean: The observed responses in the questionnaire were given weight (ranks) and then mean for each statement and for each company were calculated. These mean were then depicted in the tabular form for better comparison.

B. Percentage Analysis: Under Percentage Analysis, the mean responses of on three point Likert scale are converted into percentage form considering all the statements under different parts of questionnaire, i.e. Opinion, Learning outcome, Behavioural change and Performance.

C. T-test: The independent samples t-test is conducted on the primary data responses for hypothesis testing and t-value is calculated through SPSS statistical software. The Independent-Samples T-Test procedure compares means for two groups of cases. Ideally, for this test, the subjects should be randomly assigned to two groups, so that any difference in response is due to the treatment (or lack of treatment) and not to other factors. To Obtain an Independent-Samples T Test: This feature requires the Statistics Base option.

i. From the menus choose: Analyze > Compare Means > Independent-Samples T Test.

ii. Select one or more quantitative test variables. A separate t test is computed for each variable.

iii. Select a single grouping variable, and then click Define Groups to specify two codes for the groups that you want to compare.

iv. Optionally, click Options to control the treatment of missing data and the level of the confidence interval.
v. Finally click at OK and the results will be depicted in output window. The detailed results are presented in tabular form containing Levene’s test (f-value with significance) of equality of variance, t-test for equality of means (t-value with significance), mean difference, standard error difference, mean, standard deviation and standard error mean. The confidence interval percentage was 95% (0.05 significance level).

vi. Statistics: For each variable: sample size, mean, standard deviation, and standard error of the mean. For the difference in means: mean, standard error, and confidence interval (95% specify the confidence level). Tests: Levene's test for equality of variances and both pooled-variances and separate-variances t tests for equality of means.

D. ANOVA:

The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of two or more independent (unrelated) groups. Also, it is important to realize that the one-way ANOVA is an omnibus test statistic and cannot tell you which specific groups were statistically significantly different from each other; it only tells you that at least two groups were different. Since there may have three, four, five or more groups in study design, determining which of these groups differ from each other is important.

In the present study ANOVA is calculated to determine analysis of variance between the responses taken from five companies. It is checked whether there is any significant difference in the opinion regarding training, impact of training on learning outcome, behavior and performance of employees.

The researcher can do this using a post hoc test.

i. Click Analyze > Compare Means > One-Way ANOVA (on the top menu).

ii. Transfer the dependent variable, into the Dependent List box and the independent variable, into the Factor box using the appropriate buttons (or drag-and-drop the variables into the boxes)

iii. Click Post Hoc button for significance level 0.05, then press continue

iv. Click Options button and then tick Descriptive and then click continue

v. Finally click OK

vi. The output window will appear with the F-Value (ANOVA table).

3.10. Limitations of the Study:

There are following limitations in the present study:

i. Out of total employees in these companies, only 363 employees could be targeted.
ii. Out of total, the units of select companies operating in mainly three states Haryana, Uttar Pradesh and Gujrat are considered. Due to remote locations of the plants of these companies all the units couldn’t be tapped.

iii. Out of total companies in Oil Industry in India, only five companies (three from public sector and two from private sector) are covered in the present study.

iv. Instead of discussing large number of training programs individually, all the training programs are considered in aggregate under training practices.

v. The time period considered for the research is from 2010-11 to 2016-17 only.

3.11. Concluding Observation:

The present study is entitled ‘Impact of training practices on employee performance; an investigation of oil industry in India’ in which three companies from public sector and two companies from private sector have been considered for study, viz. HPCL, IOCL, BPCL, RIL and Essar oil Ltd. The present research is aimed to achieve specific objectives, viz. I. To study and make comparison of the training practices being followed by selected public and private oil companies in India, II. To know the opinion of employees about training practices in select public and private oil companies, III. To compare and analyze the impact of training on learning, behavior and performance of employees in public and private oil companies, IV. To suggest measures to overcome shortcomings in training practices being prevalent in these companies. The hypotheses designed considering objectives. The primary data has been collected through questionnaire and secondary data through various government reports, websites and company’s annual reports and sustainability reports. The responses in the questionnaire have been taken on 3 point Likert scale and questionnaire has been divided in four parts. The collected data has been calculated and analyzed through mean rank (weight) basis, percentage method basis, t-test and ANOVA. The results have been depicted in tabular and graphical form.