CHAPTER I
INTRODUCTION AND DESIGN OF THE STUDY

1.1 INTRODUCTION

“Automation is the use of controlled systems such as computers to control industrial machinery and processes replacing human operators”.

- Ankit Kumar Srivastava

Today's world is known as an era of technological advancement, where most of the manual work is being replaced by automated and semi-automated machineries. The technology automation is the key factor for the success and growth of any industry, because the technological changes are the powerful drivers of economic growth. In the present era the work is not only carried out manually, but also done with automation technology. Many textile industries are keeping themselves updated with modern technologies, according to the current needs of the people. The foremost intention of updating new technologies is to find out the quality improvement for their products, cut short the production time, reduce manpower, increase productivity, increase the education and skill level of workers to compete with the competitors and to sustain in the global market. By these technological advancements, the entire workplace has turned productive. At present, the skill development training programmes are very much essential for the laborers due to the technology automation. It helps to improve not only labourer performance, but also to improve the industrial growth. So, the textile industry is in need of skilled manpower to increase the growth of the industry.

1.1.1 INDIAN TEXTILE INDUSTRY

Indian Textile industry is one of the oldest and the largest industries in India and currently it is the largest industry of the country. India is the world’s second largest producer of textile goods next to China. The Indian textile industry also plays a significant role in the country’s economic growth. It has been providing one of the basic necessities of people. As, the clothing is one of the most important requirements of the people next to the food. Textile industry is providing more employment opportunities for the people next to the agricultural industry. It provides employment for 35 million people in India. Textile industry not only provides employment opportunities in the particular sector, but also provides the same in the allied industries. The Indian textile industry is mainly depending upon the textile manufacturing and exports.

The industry occupies a separate place in the economy of the country and it contributes around 27 % of total foreign exchange from textile exports, 14 % to the country’s Industrial Production, 4 % to the Gross Domestic Production of the country and 17 % to the country’s export earnings. India has the potential to increase its textile and apparel share in the world trade from the current level 4.5 % to 8 % and reach US $ 80 billion by 2020.

1.2 NEED AND IMPORTANCE OF THE STUDY

The textile industry offers employment opportunities for both skilled and semi-skilled labourers and this sector provides tremendous scope. At present, the technology has occupied a predominant role in the textile sector of India. The technology automation has now become an essential part in the functioning of the textile sector.
For the past two decades, the textile industry has started adapting many modern technologies to increase their production and are striving hard to produce more quality products so as to sustain the global market. The textile sector is mainly a labour intensive sector. The workforce employed in textile sector, has more influence on the productivity rather than technology and they are the major role players and key resources of the textile sector. The technological advancement is creating more opportunities for labour development in the recent years. Hence the labourers require effective training programmes for enhancing their skills and knowledge about the technological aspects. The technological skills of labourers can be upgraded by conducting training programmes by the concerned textile firms or the government training centres. These training programmes will be highly beneficial to the textile firms as the labourers will get an opportunity to improve their knowledge and skillset with respect to technology. It is an opportunity to retain the labourers in the textile firm.

The major agenda behind the skill training programmes in the textile sector is to improve the productivity of the industry. It is true that without proper training and knowledge about the technology, the labourers cannot contribute effectively in the field of textiles. The textile industries are in need of skilled labourers to compete successfully in the global market. The textile units are given more importance for Technological Upgradation, but the same has not been given to the skill development programmes of their labourers. Through suitable training programmes, the labourers cannot only upgrade their technological knowledge but also can contribute significantly to the productivity of the textile sector. Hence, a study is needed to understand the process and magnitude of technology automation in textile industry in Coimbatore region.
Coimbatore region is the major area of textile industry in South India and it has been providing employment opportunities to a large number of people. The textile industry in this region is experiencing automation in a faster manner. The automated technology needs skilled labour force, thus skill development is needed for labour force of textile industry. Thus the study is given importance to understand the skill development of labourers of textile industry.

1.3 STATEMENT OF THE PROBLEM

The textile industry of India has an economic significance at present, especially in the context of global market. Textile industry is a labour intensive industry and in the recent years there has been technological upgradation and automation in this sector. It is observed that the majority of the labourers working in textile sector does not have enough knowledge about the modern technologies.

The skill level is directly related with the productivity of textile units. The researcher has understood that the textile industry in Coimbatore region is in the process of automation to increase the productivity and quality. It is also understood that the skill requirements are to be developed to manage the technology automation. In this context, a descriptive study has been undertaken in this region to study the technology automation, labour skill requirements and the relevant performance. A sample survey in textile units and labourers has been undertaken to understand the problem and prospects of technology automation and labour skill development.
1.4 OBJECTIVES OF THE STUDY

The study entitled “A Study on Technology Automation and Labour Skill Development in Textile Units with Reference to Coimbatore Region” has the following objectives:

1. To study the conceptual framework of automated technology in general and in particular to textile machinery automation.
2. To study the impact of automation technology in maximizing the productivity with high quality in textile industry.
3. To identify the skill requirements for the labourers to manage technology automation in textile industries.
4. To understand the need and implementation of skill development programmes for the Labourers in the textile industry.
5. To evaluate the effects of skill development programmes on performance indicators of textile industry.
6. To provide suitable suggestions based on this study.

1.5 HYPOTHESIS

- $H_{01}$: There is no significant difference between the demographic variables and impact in the organization due to technology automation.

- $H_{02}$: There is no significant difference between demographic variables and the satisfaction level after attending the skill development programmes.

- $H_{03}$: There is no significant difference in the mean Perception level (After attending the skill development Training programme) and demographic variables.
H₀₄: There is no significant association between the demographic variables and the opinion about the level of improvement after attending the skill development training programs.

1.6 RESEARCH METHODOLOGY

1.6.1 TYPE OF THE STUDY

In the present study, the researcher has used Descriptive research based on the labourer’s opinion about the technology automation and labour skill development in textile units.

1.6.2 SAMPLE DESIGN

Population:

The machine operators working in registered textile units in Coimbatore region were taken as the population for the study. The respondent (sample) has been selected by the sample design.

Sampling Unit:

The sampling unit was considered to be the textile units registered with Associations in Coimbatore region.

Sampling Procedure:

In this study “Multi Stage Sampling” design was adopted. In the first stage, the areas of the study in Coimbatore region were selected by “Area Sampling”. In the second stage, the textile units were selected by Simple Random Sampling method to select the number of textile units. For this research respondents are selected based on “Simple Random Sampling” from each unit.
1.6.3 SAMPLE SIZE:

The total sample size was **628**

The following table provides the distribution of sample size

<table>
<thead>
<tr>
<th>AREA</th>
<th>REGISTERED TEXTILE UNITS</th>
<th>SAMPLE UNITS</th>
<th>LABOURERS</th>
<th>SAMPLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coimbatore</td>
<td>116</td>
<td>9</td>
<td>2,688</td>
<td>153</td>
</tr>
<tr>
<td>Tirupur</td>
<td>702</td>
<td>14</td>
<td>4,036</td>
<td>230</td>
</tr>
<tr>
<td>Erode</td>
<td>67</td>
<td>22</td>
<td>1,059</td>
<td>60</td>
</tr>
<tr>
<td>Salem</td>
<td>17</td>
<td>9</td>
<td>1,494</td>
<td>85</td>
</tr>
<tr>
<td>Namakkal</td>
<td>44</td>
<td>21</td>
<td>1,747</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>920</strong></td>
<td><strong>75</strong></td>
<td><strong>11,024</strong></td>
<td><strong>628</strong></td>
</tr>
</tbody>
</table>

1.7 PERIOD OF THE STUDY

The period of the research study was carried out from September 2011 to September 2014. The researcher took first six months to collect the review of literature and identify the research gap. Next six months were spent collecting details related to textile industry from textile units and associations in various places of Coimbatore region. Another six months were spent to draft the research design, to prepare data collection instruments and to conduct the pilot study. After finalizing the questionnaire, six months have been spent to collect the data from the target respondents. The researcher took six months to analyse and interpret the collected data and the last six months to prepare the thesis.

1.8 INSTRUMENTS FOR DATA COLLECTION

1.8.1 Primary Data Collection

A well-structured questionnaire was used as the instrument to collect primary data from the textile units in Coimbatore region. The questionnaire was
prepared to know the related information about textile industry like technology automation, the need and importance of labour skill developments, impacts of skill development training and schemes etc. The questionnaire method helps in fulfilling several purposes, like measurement, descriptions and drawing inferences.

1.8.2 Pilot Study

After the formulation of the questionnaire, a pilot study was conducted in the research area. Based on the labourers' opinion about the impact of technology automation and skill development, suggestions offered by the respondents, the relevant modifications were made. After that the questionnaire was finalized for the main study.

1.8.3 Secondary Data

Secondary data were collected from previous Dissertations, Thesis, Research Papers, Journals, Magazines, Textbooks, and Websites.

1.9 DATA ANALYSIS

The study results were analysed by using various statistical tools. The data collected from the respondents were analysed and presented in the form of tables. The results are compared and analysed by using descriptive analysis and inferential analysis. The following tools have been applied for data analysis through the SPSS statistical package.

❖ Simple Percentage Analysis (Descriptive analysis)

The simple percentage analysis was applied to know and simplify the demographic profile of labourers and other factors of textile units in Coimbatore region.
- **Friedman Test**

  The Friedman test is a nonparametric alternative to the repeated measures of analysis of variance. It was used to test the related factors between the groups. In this study the Friedman test was used to find the results related to the factors like impact factors of technology automation in organization and personal impacts of labourers.

- **Average Score Analysis**

  After converting the qualitative information into a quantitative one using a five point scale, the average scores were obtained from impacts in the organization due to technology automation, personal impacts of labourers in the organization due to technology automation, level of impacts on implementation of skills acquired during the skill development programme, satisfaction level after attending the skill development programmes, impact of skill development after attending the skill development training programmes, level of impact on technology automation.

- **Chi-Square Analysis**

  The Chi-Square test was used to judge the significance of population variance with a specified variance. The various hypotheses related to need of safety requirements for automated technology, the type of technical process working, technically trained labourer, participation in skill development programmes, kinds of training provided for labourers, frequency of training needed for labourers, Duration of skill development programmes, workload after attending the skill development programmes were tested by using Chi-Square test.
- **Garrett Ranking**

  To find the most important factor which is influencing the labourers and organisations, Garrett Ranking was used. For this method, respondents (labourers in textile units) have been asked to assign the rank for all factors and the outcomes of such ranking have been converted into score value. With the help of the Garrett ranking table, the present position is estimated and it is converted into scores. Then, the scores of each individual were added and the total value of scores and mean values of score were calculated.

- **Multiple Regression Analysis**

  Linear regression is used to model the value of a dependent scale variable based on its linear relationship to one or more predictors. Linear regression estimates the coefficients of the linear equation, involving one or more independent variables that best predicts the value of the dependent variables.

- **Discriminant Function Analysis**

  Discriminant analysis is a technique designed to characterize the relationship between a set of variables, often called the response or predictor variables and a grouping variable with a relatively small number of categories. To do so, discriminant creates a linear combination of the predictors that best characterizes the differences among the groups. The technique is related to both regression and multivariate analysis of variance, and as such it is another general linear model technique.

- **Structural Equation Model**

  The Structural Equation Model is used to test and eliminate the causal relationship using a combination of statistical data and qualitatively caused assumptions. It is considered as the best approach because SEM is different from
other methods and does not have a limitation on the number of variables. There is no difficulty in hypothesis testing in SEM. Because it takes the confirmatory approach rather than the exploratory approach. Many sub-criteria are considered under each criterion. The response is arrived for all the sub- criteria from the people involved in the decision making process.

1.10 SCOPE OF THE STUDY

➢ The Indian textile sector needs to focus more on skill development of its workforce and upgrade themselves to modern technologies. A study of this kind will facilitate in understanding the need for specialized skills in textile sector.

➢ The study will help the Indian textile sector to identify the need and importance of training programmes for labourers to face the cut throat competition across the globe.

➢ This study will also help to identify the skill gaps existing in this sector and the ways of bridging them.

1.11 LIMITATIONS OF THE STUDY

1. The study was conducted in Coimbatore region comprised of Coimbatore, Tirupur, Erode, Salem and Namakkal districts only. The labourers profile may differ from other region which may limit the generalization of results.

2. The data were collected from all machine operators and the respondents were not classified based on departments wise. The department specific labour skills were not collected and this may be a limitation of the study.

3. Only registered textile units have been focussed and the unregistered units are not in count under this study.
1.12 SCHEMES OF CHAPTER

The present study has been divided into five chapters

The First Chapter deals with the Introduction and design of the study. This includes Introduction, Importance of the study, Statement of the problem, Objectives of the study, Methodology of the study, Period of the study, Scope of the study, Limitations of the study and Schemes of the chapter.

The Second Chapter deals with the review of related concepts and the already existing literatures available in the field of textile industry and labourers skill developments in textile industry.

The Third Chapter presents the profile of the study area of the research, such as the profile of Coimbatore region and aspects of textile sector. It includes Coimbatore, Tirupur, Erode, Namakkal and Salem districts. The theoretical framework of textile industry, technology automation, methods of training for skill development for labourers, types of skill training for labourers are given in this chapter.

The Fourth Chapter expresses about the analysis and interpretation of the study. The data collected from the respondents were analysed and presented in the form of tables. Bar charts are used at various places as a statistical tool.

In the Fifth Chapter the key findings, suggestions and conclusion are presented.