CHAPTER III
PROCEDURE AND TECHNIQUES

To carry out any research investigation, it is necessary to adopt a systematic method and procedure. By methodology of any research we mean the formulation of objectives and hypotheses, selection of the representative sample from general population, applying appropriate research tools and techniques, collecting relevant tools and analysis and interpretation of the same for scientific investigation of the problem.

After having a thorough review of related literature, the present study was entitled as: "Adult Education Training And Productivity - A Study of Workers In Orissa".

The study was undertaken with the following objectives:

1. To study the effect of adult education programme on the development of literacy skills of reading, writing and numeracy; and awareness aspects of workers.
2. To study the attitude of workers towards adult education programme.
3. To study the effect of adult education programme on development of working skills of workers.
4. To study the effect of adult education programme on workers' productivity.
5. To conduct separately case studies of maximum and minimum producing workers.
Keeping in view the objectives stated above, the following hypotheses were formulated for the present study:

1. **Hypotheses On Literacy Skills**
   (a) Workers acquire prescribed level of reading skills as a result of adult education programme.
   (b) Workers acquire prescribed level of writing skills as a result of adult education programme.
   (c) Workers acquire prescribed level of numeracy skills as a result of adult education programme.
   (d) There is no sex difference in acquiring reading, writing and numeracy skills.
   (e) There is no caste difference in acquiring reading, writing and numeracy skills among general, Scheduled caste (SC) and Scheduled Tribe (ST) workers.

2. **Hypotheses On Awareness**
   (a) Workers differ significantly in awareness as a result of adult education programme.
   (b) There is no sex difference in awareness as a result of adult education programme.
   (c) There is no caste difference in awareness as a result of adult education programme among general, SC and ST workers.

3. **Hypotheses On Attitude**
   (a) Workers show positive attitude towards adult education programme.
   (b) There is no sex difference in the attitude of workers towards adult education programme.
There is no caste difference in the attitude of general, SC and ST workers towards adult education programme.

4. Hypotheses On Working Skills
(a) Working Skills of workers improve significantly as a result of adult education programme.
(b) Male and female workers do not show significant difference in the improvement of working skills.
(c) General, SC and ST workers do not show significant difference with improvement of working skills.

5. Hypotheses On Productivity
(a) The productivity of workers improve significantly as a result of adult education programme.
(b) There is no sex difference in the productivity of workers due to adult education programme. (c) There is no caste difference in the productivity among general, SC and ST workers as a result of adult education programme.
(d) There is positive co-relation between literacy skills and productivity of workers.
(e) There is positive relationship between awareness and productivity of workers.

Operationalisation of Terms and Concepts Used
Adult Education
In the present study, adult education has been conceived as an organised activity of learning thereby the adults acquired the skills of reading, writing and numeracy.
as well as develop awareness in the areas of environmental protection, health care and family planning, social, economic, scientific, cultural and legal aspects. Some ideas about the working skills of punctuality, cleanliness and co-operation were also included in the programme. In the light of this definition, the concept of adult education consists of reading, writing, numeracy, awareness and some aspects of working skills. The acquired level of reading, writing and numeracy skills may be further specified as follows:

**Reading Skills**

Acquired level of reading skills consists reading silently small paragraphs in simple language at a speed of 35 words per minute, reading with understanding of road signs, posters, simple instruction and newspaper for neo-literates and reading of simple written messages taken out from the primer.

**Writing Skills**

Writing Skills consists of writing names of familiar objects (vegetables, fruits, friends, animals, birds etc), writing independently short letters, applications and completing of some forms.

**Numeracy Skills**

Numeracy Skills consists reading of two numerals, writing of numerals, simple calculation of addition, and subtraction up to three digits and multiplication and divisions of two digits, working knowledge of metric units of weights, measures, currency, distance and area, and units of
The above mentioned three skills of reading, writing and numeracy were decided as per level of literacy defined by National Literacy Mission. In this study, the terms of adult education, adult education programme, adult education training and literacy programme have been used interchangeably.

(iv) **Productivity**

Productivity can be more correctly stated as the relationship between achieving a result and the time it takes to accomplish it. Hence, productivity can be found by following method, i.e. Result/Time.

The formula based on physical output may be adopted for measuring productivity at the industrial level. In case of industries manufacturing a single product, the measurement of productivity is simple. Algebraically, productivity is measured by $q/m$, where $q$ is quantity or unit of output produced and $m$ is number of man-hours worked.

In the present study, the workers productivity means: "the total quantity of cotton packets produced by the worker per day".

**Design of the study**

In the present study which is experimental in nature, single-group Pre-test and Post-test design was employed. The same group of workers were observed in Pre-test session on different variables such as awareness, attitude, working skills and productivity; and the same group were also observed in Post-test session on variables like literacy...
skills, awareness, attitude, working skills and productivity. The difference of performances between Pre-test and Post-test was attributed to the training programme i.e. adult education programme. The design may be presented as:

$$0_1 \times 0_2$$

where, $0_1$ represents Pre-test, $0_2$ represents Post-test and $X$ represents treatment. Single-group Pre-test and post-test design was preferred in this study on the rationale that in case of control group and experimental group design, there would be carry-over effect of treatment on control group in two-groups design since all workers belong to same factory and worked at same place. Moreover, their residences were also very nearer to each other.

SAMPLE OF THE STUDY

The purposive sampling design was employed for selection of twenty illiterate workers in two phases which are as follows:

i. First Phase

First phase of the sample dealt with the selection of an industry for conducting the training programme. After survey of ten organisations, Gangpur Spinning Mill, Sundargarh was selected for the present study with the due permission from the Manager of the Mill. The following factors were considered for selection of the mill which are:

a) output of the mill can be measureable on the basis of physical units,
b) about 50 illiterate workers would be engaged in the similar type of activities in the mill,

c) there should not be any plan to change the manpower and machinery of the mill during training period.

ii. Second Phase

Second phase dealt with the final selection of the workers who would be exposed for the training programme by keeping in view various criteria like age, sex, caste, monthly income, working experience and schooling in consideration.

a. The age group of workers of 25-35 years were selected since this is regarded as the most productive age group,

b. Male and female workers were selected to see sex difference as a result of literacy programme,

c. Workers of different categories of caste variable (General, Scheduled caste and Scheduled Tribe) were selected to see the difference of productivity among them,

d. To control economic standard of workers, monthly income was taken in to consideration,

e. Workers were selected by considering experience of 5-6 years because only a limited number of workers of this duration were available, and

f. initial schooling was also controlled by selecting workers who had no schooling experience.
Distribution of the sample of workers in relation to caste and sex are mentioned as follows:

<table>
<thead>
<tr>
<th>Caste</th>
<th>Sex</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>S.C.</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>S.T.</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>General</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>7</td>
</tr>
</tbody>
</table>

TOOLS USED

The following tools were used in this study:

i. An Interview Schedule to know worker's background;

ii. Observation schedule for recording working skills and productivity of workers;

iii. Interview schedule to know worker's opinion towards adult education;

iv. A self-prepared literacy test for reading, writing and numeracy skills; and

v. An self-prepared Awareness Test.

A comprehensive description of each tool is mentioned below-

i. An Interview Schedule to know Workers' Background

This schedule contained 35 items. The major aspect of this schedule was workers' background including father's name, age, caste, marital status, annual income, occupation, job description and whether workers need adult education programme or not. These items were asked to workers and
filled in by the investigator in face to face situation which provided an opportunity to establish report between the investigator and workers. An outline of interview schedule was given in the Appendix I.

ii. **Observation Schedule for Recording Working Skills and Productivity of Workers**

An observation schedule was used for collecting data pertaining to workers' productivity and working skills. Hence, the observation schedule may be consisted of two parts, one of which is related to workers' productivity and the other one to working skills. The first part of the schedule is concerned with the quantity of cotton packets produced per day. Each worker's productivity of cotton packets per day was observed continuously for ten days before and after the treatment. The weight of one packet of cotton is 4.5 kg. and forty packets make one bale. The average cotton packets produced per day was calculated on the basis of total cotton packets produced in 10 days.

The second part of the schedule was constructed for recording of working skills of the workers also observed continuously for ten days before and after the treatment. Five types of working skills were also selected which are (a) punctuality, (b) cleanliness, (c) co-operation, (d) attention and (e) communication. The areas decided for application of these working skills can be discussed as follows. Punctuality was observed through (i) regularity of coming by the workers to the mill, (ii) regularity of the workers in attending
literacy classes, (iii) regularity of workers in completing daily assignments before leaving the mill, and (iv) regularity of workers in domestic activities. Cleanliness was observed through (i) wearing dresses, (ii) physical cleanliness before taking meal, (iii) maintaining cleanliness at working place, and (iv) maintaining cleanliness in domestic activities. Co-operation was observed by keeping these points in view: (i) co-operation with colleagues, (ii) co-operation with officials in the mill, (iii) co-operation during literacy classes, and (iv) co-operation in social activities. Attention was observed by considering these points: (i) attention during teaching of literacy programme, (ii) attention at the time of handling of machines in the working place, (iii) attention for learning from colleagues’ work, (iv) attention towards any novel activity. Communication was also observed by keeping these points in view: (i) active participation in discussion, (ii) exchange of ideas among colleagues on literacy, awareness and productivity, (iii) interaction with instructor for discussing various problems of the literacy programme, (iv) interaction with the manager and other officials regarding any problem or suggestions related to the mill.

These above mentioned working skills have been regarded as qualities which can help in improving the performance of workers as there will be less wastage of time. It can also lead to better commitment to work which is essential for higher productivity.
Total score was decided by the experts of SRC, Orissa as 20 for selecting five skills (Punctuality, cleanliness, co-operation, attention and communication) in which each skill carries 4 score and each of the skills, which have been divided into four areas was assigned with one score each. The method of scoring on five working skills was like this: when the worker applied a particular aspect of any skill during observation, he was given one score and zero for not applying the skill. The average score of five skills before and after ten days of the treatment was regarded as score of working skills. Workers securing 14 and above score was regarded as better skilled worker of the mill.

ii. Interview Schedule to know Workers' Attitude Towards Adult Education

An interview schedule was employed to assess opinion of workers towards adult education. It was decided that this opinion would be formed into attitude in the long run. This schedule consisted of 20 statements in which each statement was scored on the basis of 'Yes' and 'No' type of answer. The author preferred to prepare 'Yes' 'No' type of answer by thinking that illiterate workers would be confused with the alternatives of Likert and Thurstone's attitude scale. Therefore, this schedule was locally standardised. The procedure followed for preparing the schedule is given below.

Sixty statements, each expressing one opinion was prepared in Oriya language after a careful study of relevant literature and in consultation with experts in the concerned
field. In order to see the standardization of the test, a list of statements were supplemented through informal interviews with 50 industrial workers and 50 participants of different adult education centers of Sundergarh district. For verifying the statements collected, following criteria were suggested:

a) The Statements should refer more to the prevailing conditions than to the past;
b) each should be capable of eliciting an opinion;
c) These should be clear, precise, straightforward and not liable to be interpreted more than one ways;
d) These should contain only one complete thought;
e) The statements should have unambiguous and simple words but not too long sentences;
f) These should not be irrelevant to the topic under study; and
g) Favourable and unfavourable statements must approximately be equal in the number.

Each statement was carefully examined by following the above criteria. As a result of rigorous screening, 25 statements were retained. Then the statements were presented to a panel of experts for methodological criticism. They were also requested to classify the statements expressing favourable and unfavourable attitude, (2) to delete redundant statements, (3) to point out ambiguous words or items, and (4) to suggest any modification in the statement that they deemed
to be necessary. By following the criticisms and comments of
the experts, only 20 items were retained in each list and
some of the terms were modified. The statements were tried
out on 10 workers of the spinning mill in order to see its
language, structure, meaning of words, subject familiarity
etc. Slight modifications were made in the statements based
on the experience gained in the try-out test. After carefully
editing the items, the opinionnaire on adult education was
prepared. The scale was consisted 10 statements showing
positive and 10 statements indicating negative opinion. The
statements were arranged in a random sequence from the draft
scale. The items were to be answered by the illiterate adults
in 'Yes' and 'No' responses. Each correct 'Yes' response was to
be given one score and incorrect 'No' response with no score.
The maximum score on this schedule was 20 and minimum
possible score was zero. On the basis of scoring, the workers
who got ten or more than ten scores were considered to be
having positive opinion towards adult education. Those who
got nine or less than nine were taken to be having negative
opinion towards adult education. The opinionnaire have been
given in Appendix III.

iv. A Self Prepared Literacy Test for Reading, Writing and
Numaracy Skills

A literacy test consists of reading test, writing test
and numeracy test which has been giving in Appendix IV. While
planning for constructing a literacy test, a 'Blue-Print' was
prepared by the following criteria: (i) major objectives of
adult education programme, and the target group from whom the
test is meant for was kept in focus, (ii) whether specific items in the test were relevant and applicable to the target group tested or not, (iii) the items for these tests were selected from the primers which were used for literacy programme, (iv) testing situation was confined to 45 minutes for each test of reading, writing and numeracy, (v) 40 weightage to reading test, 30 weightage to writing test and 30 weightage to numeracy test was given as per norms of National Literacy Mission, (vi) letters and words with which workers were familiar in literacy classes, were in the test, (vii) schedules of literacy were printed on the same size as it was printed primer, (vii) for smooth administration of the tests, clear instructions were given in each test, (viii) items were made free from ambiguity, overlapping and arranged in ascending order of difficulty, (ix) literacy tests were prepared before starting the programme. Since the workers were illiterate, pretest for literacy was not conducted.

A literacy test on reading, writing and numeracy were prepared on the basis of 'Blue Print' described below:

'Blue Print' of Literacy Test

Competency Area - Reading;

Total score-40

Competency R(a)

Reading allowed with normal accent of sample passage on a topic related to the interest of the learners at a speed of 30 words per minute.
Procedure for Evaluation

1. A short passage of 3 sentences of small length will be selected from 'Amakatha' primer II.

2. The learner will be asked to read it loudly and his/her accent observed.

3. Those who read the sentences correctly and without breaking the words into letters and exhibit normal accent would be considered to have scored the maximum (8). Scores would be decreased proportionately for those who could not read correctly.

4. Testing of speed is not practical and so it may not be necessary. Thus, it will be an oral testing.

Competency R(b)

Reading silently small paragraphs in simple language at a speed of 35 words per minute.

Procedure for Evaluation

1. This competency will be tested as part of R (d).

Competency R(c)

Reading with understanding road signs, posters, simple instructions and news-papers for neo-literates, etc.

Procedure for Evaluation

1. Here, the understanding of 'simple instructions' and 'road signs' have been combined and treated together. An example from either could be used.

2. Similarly, the understanding of posters, new literate news paper have been combined and simple examples of either category could be used for testing the
understanding of the learners. This could be from familiar texts.

3. Thus, these are four situations which will determine the form of testing, namely, reading road sign, reading simple instruction, understanding posters and understanding newspaper for neo-literates.

4. The rating score will be 4 for good, 3 for Average, 2 for poor and 0 for each situation.

5. Total score for this ability would be 12.

**Competency R(d)**

Ability to follow simple written messages relating to one's working and living environment.

**Procedure for Evaluation**

1. The competency of R(b) will be a part of this.

2. The learners will be required to read simple written messages taken out from the primer part-III.

3. There will be four oral questions based on what they have read.

4. Each correct reply will be given a score of 5. Scores would be decreased proportionately for those who could not read correctly.

5. Maximum score for this will be 20.

**Competency Area-Writing**

Total Score - 30

**Competency W (a)**

Copying with understanding a speed of seven words per minute.
Procedure for Evaluation

1. This is a rudimentary skill which does not require any testing because during primer-I, II, and III, substantial practice has already been given for copying the written test in the primer.

2. In copying, the speed is not of much significance as one can take any time for this purpose.

3. Hence this skill will not be tested.

Competency W (b)
- taking dictation at a speed of five words per minute.

Procedure for Evaluation

1. The learner will be required to write names of five familiar objects (vegetables, fruits, friends, animals, birds, etc.).

2. Each correctly written word will be given one score.

3. Maximum score for this competency will be 5.

Competency W (c)
- Writing with proper spacing and alignment.

Procedure for Evaluation

1. This competency will be tested along with W (d).

Competency W (d)
- Writing independently short letters and applications and forms of day-to-day use of the learners.

Procedure for Evaluation

1. Three types of situation have been given in the norms which are short letters, applications and forms. The competency will be evaluated for two situations,
namely, writing of a short letter and filling up of a form.

2. While writing the letter, a typical situation could be given to the learner and he/she will be required to write a short letter on it to a near friend or relative.

3. The scoring will be done on the following basis:

(a) Short letters-
- Date as part of the format of the letter ----------- 1
- Text/body/message of the letter ------------------- 10
- Address of the person to whom the letter is sent ---- 4
- Correct spacing ------------ 2
- Word formation -------- 1

(b) Filling up a form

As far as the ability in filling up of form is concerned, each learner could be asked to write the following:
- His/her name
- Father’s Name
- Age
- Occupation
- Name of the village and district.

Each item will carry one mark and, therefore, total marks will be 5.

4. Maximum score for writing skills will be 30.

COMPETENCY AREA - NUMERACY

Total Score 30.
Competency N (a)

To read and write 1-100 numerals.

Procedure for Evaluation

1. Two numerals of 2 digits, each have already been given in R (a) which the learner will be asked to read.
2. Thus, reading of numerals will be scored under the competency of reading skill R (a).
3. For testing the skill in writing of numerals, the learner will be asked to write 6 numerals of two-digits each.
4. For each correct writing, the learner will get 1/2 score.
5. Maximum score for this competency will be 3.

Competency N(b)

Doing simple calculation without fraction, involving addition, substraction upto three digits and multiplication and divisions by two digits.

Competency N(c)

Working knowledge of metric units of weights, measures, currency, distance, area and units of time.

Procedure for Evaluation

1. The two competencies N (b) and N (c) will be treated together for purposes of testing the abilities in addition and substraction.
2. Since the numerals learnt are upto 100, the items for substraction will be limited to two digits only.
3. For multiplication, the item will have single digit as the multiplier.
4. For division also, the divider will be a single digit number and divisor a 2-digit figure.

Addition

5. For testing the competency in addition, the following examples are suggested:

(a) One question of addition of 2 digits number in which no carry-over is involved (score = 1);
(b) One question of two digit numbers, involving carry-over (Score=1);
(c) A simple problem involving addition of kilograms and grams not involving carry-over (Score = 2);
(d) A simple problem involving addition of money (Rupees and Paise) not involving carry-over (Score = 2);
(e) A simple problem involving addition of distances in kilometers and meters not involving any carry-over (Score=2); and
(f) The skills in understanding the unit of time will be judged by showing a diagram of a clock (Score = 2);

6. Maximum score for this competency 5 (a) to 5 (f) will be 10.

Subtraction

7. For testing the competency in substraction, the following examples are suggested-

(a) One question on substraction of two digit numbers will be given in which no borrowing is involved (Score=1);
(b) One question of two-digit numbers relating to substraction will be given which will involve borrowing (Score = 1);
(c) A simple problem involving substraction relating to weight (Kgs. and Cms.) not involving borrowing will be given (Score = 2);

(d) A simple problem relating to transactions of money (rupees and paise) and involving substraction without any borrowing will be given (Score = 2);

(e) A simple problem pertaining to substraction and involving measure (Meters and centimeters of liters and milliliters) will be given, without any borrowing (Score = 2); and

(f) A simple problem involving time difference will be given in which borrowing is not involved (Score = 2);

8. Maximum score for this competency will be 10.

**Multiplication**

9. The abilities in multiplication will be tested by giving three direct questions and one simple problem on multiplication where the number to be multiplied is a two digit number and the multiplier is a single digit number. The product should not exceed 100 as the learners have been taught numbers upto 100.

Examples:

<table>
<thead>
<tr>
<th>20</th>
<th>39</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>x3</td>
<td>x2</td>
<td>x7</td>
</tr>
</tbody>
</table>

10. Each correct answer will have one mark (Total score = 3);
11. one simple problem involving multiplication relating to division, transaction of money with two digits only (score = 2); As in multiplication, for division also the divisor will be a two digit number and the divider, a single digit figure.

12. Three simple questions will be given where no remainder comes.

Examples:
(a) 44 ÷ 4
(b) 56 ÷ 7
(c) 96 ÷ 6

13. Each correct answer will earn 1 mark, total score being 3;

14. One simple problem involving division relating to the transaction of money (Score = 2);

15. Maximum score for N (b) and N (c) will be 30.

<table>
<thead>
<tr>
<th>Expected Proficiency in Different Skills:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skills</strong></td>
</tr>
<tr>
<td>(a) Reading with comprehension</td>
</tr>
<tr>
<td>(b) Writing</td>
</tr>
<tr>
<td>(c) Numeracy</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

v. A Self Prepared Awareness Test

Though awareness aspects are concerned with literacy, author decided to prepare a separate schedule of awareness
test for its independent assessment. Like literacy tests, the following factors were considered before planning for a blue-
print on awareness test:

(i) the objectives of adult education programme and the target group for whom the test is meant, were kept in focus;

(ii) whether the content of the test i.e specific items in the test was relevant and specific to the target group, was judged;

(iii) the items for this test were selected from the primers which are used for literacy programme;

(iv) expert's opinion was sought for finalisation of items;

(v) 50 weightage was given to this test for 25 objective type items where workers were asked to answer within one or two sentences of each question;

(vi) letters and words with which workers were familiar in literacy classes were presented in the test. Schedule was presented on the same size in which the primer is printed;

(vii) clear instructions were given for smooth administration of the test; and

(viii) awareness test was prepared before pre-testing.

'Blue Print' of Awareness Test

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>content areas</th>
<th>No. of items</th>
<th>% of Items</th>
<th>Weigh-</th>
<th>% of Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>General awareness</td>
<td>4</td>
<td>16</td>
<td>6</td>
<td>16</td>
</tr>
</tbody>
</table>

contd...
<table>
<thead>
<tr>
<th></th>
<th>Aspect</th>
<th>3</th>
<th>12</th>
<th>6</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Health care &amp; family planning</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Environmental protection</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Economic awareness</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Scientific awareness</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>Social awareness</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Religious, Arts &amp; Architecture</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>Legal aspect</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>Total items</strong></td>
<td>25</td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Equal weightage was given to each aspect of awareness except general awareness which was given 16 percent weightage in order to make total weightage 50. Time duration for the test was decided with the help of try-out method. The awareness test was presented in Appendix V. Like literacy test, it was decided that if a worker achieves 35 scores i.e 70 percent in awareness test, he would be regarded as a conscious worker of the society.

**PROCEDURE**

Procedure of the study has been reported in two parts:

i. Pre-experimental stage, and

ii. conduct of the experiment.
i. Pre - experimental stage

This stage consists of content analysis, methods of teaching, instructor and duration of teaching programme. Before conducting of the experiment, the above aspects were analysed which were used in the initial stage. This was the preparatory stage for the conduct of experiment.

a. Content analysis

For the selection of a suitable and relevant content for the training programme, it was necessary to consider worker's background information as well as need analysis views. Some experts, researchers and personnel on adult education were consulted regarding selection of a suitable content. Coombs (1973) recommended that the ingredients of adult education programme are the acquisition of "positive attitude, sufficient functional literacy and numeracy to read with comprehension a national newspaper or magazine------to write a legible letter------and to handle important common computations------a scientific outlook and an elementary understanding of the process of nature, functional knowledge and skills for learning a living, functional knowledge and skills for civic participation". Gayatonde (1977) recommended that workers prefer the aspect of citizenship, functional literacy and individual development. Mali (1979) revealed that the kind of reading materials used was a significant factor affecting retention of literacy. Nagappa (1966) in his study revealed that topics regarding functions of village panchayat, health of the family and community diseases,
animal husbandry concerning on occupations attracted interest of neo-literates. Mallikarjunaswami (1969) revealed that religious and folk literatures have high appeal for the neo-literates and materials related to working life.

Reviewing the above mentioned studies and opinion collected from instructors, supervisors and adult learners of ongoing adult education centers in the district of Sundargarh, the following criteria were fixed for the selection of final content for adult education programme: (i) content used was based on need and interest of workers, (ii) the level of content was similar with the level of National Literacy Mission, (iii) a brief knowledge of social, economic religious, civic, health and environmental aspects was included for the development of awareness, (iv) various skills and techniques for speed and better work was included in the content. Keeping these criteria in mind, the researcher surveyed the available primers on adult education. State Resource Center (SRC), Bhubaneswar (Orissa), is a pioneer organisation in publishing primers on adult education for illiterate population of Orissa. Other Organisations like Directorate of Adult Education, Orissa and Center for Adult, Continuing Education and Extention, run by different Universities and sponsored by U.G.C. were also consulted for selection of suitable context. Lastly, with the consultation of State Resource Center (Orissa), three primers named "Amakatha" part-I,II,III were initially selected for content analysis in order to judge their suitability for the present
study. Lesson-wise analysis of content of "Amakatha" Part I, II, III was done by the researcher. A brief description of content analysis of pimers was mentioned below:

1. Analysis of 'Amakatha' (part-I)

This primer contained eight lessons and one questionnaire which were provided after completion of all lessons. The literacy content covered 13 vowels, 26 consonants and matra, reading of small sentences, recognising letters and words with pictures. The numeracy content covered reading and writing of numbers from one to ten, counting numbers from one to five and simple addition of two digits numbers. So far as awareness aspect is concerned, the usefulness of landed property, filtered water and fresh air for life was highlighted and discrimination of sex was criticised. Saving money for future was advised as well as health care was also emphasised. In one lesson, workers were encouraged to work co-operatively without any dispute for a better working environment.

2. Analysis of 'Amakatha' (part-II)

This part of 'Amakatha' was more complex than part-I. The content level of literacy was strengthened with complex 'matra', reading of small sentences, words, small stanza, proverbs, small story, reciting poems, follow-up sentences, construction of words, question-answers, objective questions and writing names of the picture. Remembering numbers from 51 to 100 in Oriya, identification of coins, summation of coins, addition of two digit numbers, counting of numbers from 70 to
80. simple subtraction of two digit numbers, identifying missing numbers in a series, simple mathematical problems of subtraction on kilograms and rupees and ideas about weight measures such as gram, kilogram, quintal, ton, miter and kilometer were the main features of numeracy aspect. In order to make illiterate adults vigilant about present day society, very useful information was included in this part. For eradication of blind belief, it was even mentioned that a barking crow speaks about time but not conveys about arrival of guests and relatives. The importance of forest as a supplier of trees, flowers, fruits, woods and grass was highlighted. The belief that fearness causes diarrohea and tantrik can cure it, was regarded as wrong ideas and workers were advised to remove this misconception from their mind. Other useful information about National bird, benefit of cooperative society, narrator of Mahabharata, Sun temple, various festivals and religious leaders were provided to workers in this part. The importance of working skills of cooperation and punctuality was also highlighted in this primer.

3. Analysis of 'Amakatha' (part-III)

Content knowledge of Amakatha-III is more comprehensive than other two primers. Literacy aspect covered complex alphabets, short stories, word construction, question-answering, brief writing of answers, fill-up blanks by appropriate words, synonyms, short poems of Bhim Bhoi, patriotic songs, National songs, writing an application and
filling-up M.O. form; Numeracy aspects contained simple multiplication, mathematical problems of multiplication, simple division of two digits, able to see time from watch, idea about year and months, mathematical exercises on addition, subtraction, multiplication and division, measurement of temperature by thermometer and measurement of landed area. Awareness aspect consisted topics on health care, voting, plantation, environmental protection, Jana Yatra, scientific uses in day-to-day life, idea about thermometer, hills, rivers, great men, poets, and religion. The benefits of working together by co-operating with each other was highlighted as one of the important working skills. The usefulness of cleanliness also has been highlighted in this primer.

From analysis of primer of 'Amakatha' part-I, II, III, it was noticed that literacy, numeracy and awareness aspects were suitable for the present study in order to achieve the stated objectives, but content knowledge regarding selected working skills was inadequate. The working skills of punctuality was highlighted in lesson No. 1 and 2 of 'Amakatha' part-II. The working skills of co-operation was emphasised in lesson No. 5 and 7 of 'Amakatha' part-II and in lesson No. 1, 6 and 8 of 'Amakatha' part-III. The usefulness of cleanliness was imparted in lesson No. 3 of 'Amakatha' part-III. Regarding working skills of communication and attention, nothing was mentioned specifically in selected primers. This lacking of content knowledge on working skills of
communication and attention was minimised by discussion. Regarding development of each skill, group discussion was held during literacy training with the participation of all workers, instructors and two experts of Workers' Education Centres, Rourkela were invited for discussion. First of all, experts delivered lectures on how to develop working skills which was followed by a group discussion. Through discussion, importance of each skill, how to develop the same and usefulness of each skill for present activity and future life was highlighted. Lastly, workers were motivated to speak about their gaining from the discussion session. For development of each working skill, a separate discussion was held within a time gap of fifteen days.

b. Methods of teaching

There are four relative methods of teaching, reading and writing to adult illiterates as stated by Rao (1981) which are as follows: (i) alphabetic method in which only reading is taught first and then writing, (ii) alphabetic method-reading and writing simultaneously, (iii) sentence method-first reading for two months and then writing, (iv) sentence method-reading and writing simultaneously. Nagappa (1966) in his exploratory study found that story method of presentation of new ideas has a higher appeal to neo-literates.

In the present study, the primers were used which was prepared by the State Resource Centre, Bhubaneswar. The primers are based on IPCL(Improved pace and content of
learning) which aims in providing rich and need-based content to the learners inorder to keep their interests in the learning process. The main strategy of teaching is the simultaneous use of reading-writing of words and letters of alphabets. It was decided to follow a participatory approach for active involvement of workers and to apply story-telling method for few lessons where requirement was felt. A direct and personal attention was given during instruction. Vocabulary used by the instructor was matched with primers and local language. To create motivation among workers throughout the literacy programme, various co-curricular activities like Bhajan, song competition, padayatra and cleaning of a village pond were organised.

c. Instructor

The researcher, on the basis of his own experience (who was an instructor during graduation stage for teaching illiterate adults of the local community and later one as an adult education Officer in a Govt. College, and ultimately as a Key Resource Person in total literacy programme) preferred to teach workers him-self rather than selecting any instructor from out side. The researcher consulted various experts in State Resource Centre (SRC) regarding the various common approaches that they use in the teaching-learning process. A long discussion was held with the experts to adopt the approach commonly used in the adult literacy classes. The strategy adopted was reading and writing of words/alphabets simultaneously. However, for any discussion
in working skills, experts from relevant organisations were invited for better motivation.

d. **Duration of teaching programme**

Duration of teaching programme consisted two aspect, such as duration of total teaching programme and duration of each teaching period. Khan (1958) suggested 125 hours for duration of teaching programme. Shankar (1972) experimented with two alternative approaches on literacy training. In one approach, the participants attended a six months course with a rigid time schedule and programme break-up. In an alternative approach, the same course was extended to nine months which showed that the extending period resulted in better writing speed but poor reading speed. Mali (1984) suggested that duration of a class is influenced by three factors: (i) Socio-economic conditions of learners, (ii) the environmental conditions of the adults, and (iii) contents of the course. When all these factors change, duration is bound to change. The duration of a literacy class is related primarily to the expected level of attainment of literacy skills. National Literacy Mission (1992) recommended that duration should be of five to six months with one and half hour of learning per day for about twenty-two days in a month.

After considering all these above mentioned views, it was decided that adult education programme would be conducted for a period of six months amounting 225 hours. During this duration, the literacy programme was conducted one and a half
an hour per day for 25 days in a month. Each worker attended 90 percent of classes in order to be present for at least 200 hours in the entire teaching programme.

ii. Conduct of the Experiment

The experiment was conducted in three phases given below:

Phase I
(a) Administration of awareness test and attitude in pre-test session.
(b) Observation of productivity and working skills in pre-test session.

Phase II
(a) Conduct of adult education teaching programme during the treatment.

Phase III
(a) Administration of Literacy Test, Awareness Test and attitude in post-test session.
(b) Observation of productivity and working skills in post-test session.

Phase I
(a) Administration of awareness test and attitude in pre-test session.

Twenty workers were interviewed on awareness test and attitude test one after another in pre-test session. Their independent scores were recorded carefully for statistical analysis.
Observation of productivity and working skills

The productivity of each worker was observed for 10 days continuously without their knowledge and the productivity score of each worker was recorded. Similarly, working skills performed by workers were recorded for 10 days continuously with a thorough observation. Various activities of phase-I were completed by the end of January, 1992.

Phase II

Conduct of adult education teaching programme as the treatment

First of all, workers were made familiar with the literacy programme through informal and cordial discussion in the presence of manager of the mill and concerned officials of the locality. A brief description of the teaching programme and its importance was presented to all workers in order to motivate them in the programme. Adult education teaching was imparted in the locality where most of the selected workers of the Spinning Mill were living.

The teaching programme started with 1st lesson of 'Amakatha' Part-I. After completion of all lessons, workers were assessed with the questionnaire which are given at the end of 'Amakatha' part-I. The questionnaire contains items of reading, writing, numeracy and awareness aspects. This formative evaluation of the worker served as a diagnostic function and indicated the progress as well. Productivity of each worker per day was also recorded after completion of part-I of 'Amakatha'. The same procedure was adopted after completion of primers (part-II & III) which helped to
identify the constraints during conduct of teaching programme. Feedback was provided to workers who were low achievers in the questionnaire and productivity. The comparative scores of questionnaire of primers (part-I, II, III) as well as productivity through formative evaluation mentioned in Table 3.1. For the development of working skills, discussion method was employed with the assistance of experts invited from workers' Education Centre during the conduct of training programme. Performances in the working skills and attitude were assessed only at post-test session with the assumption that development of skills and attitude is a time-consuming process. So, a duration of two months of instruction may not be adequate to develop these skills among the workers.

During the treatment, some entertainment programmes like bhajan, kirtan, music competition and social welfare activities were organised in order to motivate workers throughout the teaching programme.

The teaching programme started from 1st February 1992 to 31st July, 1992 with a duration of six months. As per the convenience of workers, the teaching session starts from 6 P.M. to 7.30 P.M. everyday except some occasional deviation. Attendance of each worker was marked regularly after completion of everyday teaching session. Frequent absentees were motivated through personal contact in order to come timely and regularly to the teaching session. The manager of spinning Mill was invited three times during teaching session.
## Table 3.1

Formative Evaluation of Workers' Productivity and Literacy

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in order to know about the progress made by workers in different aspects. As mentioned previously, the researcher himself conducted the training programme with the cooperation of some local experts who were involved in total literacy programme of the district.

Phase III

(a) **Administration of literacy test, awareness test & attitude test in post-Test.**

Post-testing session started just after completion of the training programme. Workers were post-tested on the variables of reading, writing and numeracy skills, awareness and attitude with the same tools which were applied in pre-testing session.

(b) **Observation of productivity and working skills in Post-test session.**

Observation method was employed for recording the frequently performed working skills by each worker. The period of observation continued for 10 days and the same schedule was recorded which were applied in pre-testing session. Similarly, the productivity of each worker was recorded 10 days continuously in the schedule which was employed in Pre-test.

Post-testing session continued upto the end of August 1992.

**Statistical Techniques Used For Analysis of Data.**

To analyse the data and test the hypotheses, the following statistical techniques were employed:
i. Descriptive statistics like means and S.D.'s of literacy scores, awareness scores, attitude scores, working skills and productivity scores,

ii. t-ratio was used to find the significant difference between the means, and

iii. Product-moment correlation was applied to see relationship among different variables.