CHAPTER – III

DESIGN
&
PROCEDURE

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DESIGN AND PROCEDURE

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CHAPTER III DESIGN AND PROCEDURE.

3.0.0 INTRODUCTION :

The present study is mainly aimed to examine the effect of Advance organizer model and to compare it with the traditional method of teaching. The researcher has selected one topic from section first, communication skills i.e. Expressing Attitudes and opinions and never a perfect spouce and The Indian Serenade from section second, Reading comprehension. The study has revealed the exploiting basic logical relationship between a skill and its corresponding language elements in the cognitive language structure; the topics have been planned as such by using Advance organizer Model and traditional method. The objectives and hypothesis of the study has been described in chapter one. In the present chapter the methodology followed in carrying out the study has been described in details under various labels like sample design, content taught, tool of the study, measure of achievement, data collection, statistical technique used etc. The details of each are as follow:

3.1.0 SAMPLE.

The sample consisted 60 student teachers from the total population of 80 student teachers, which is 75% of the total population. The sample is selected by randomization (Lottery method). The student teachers have been studying in the first year of B. A. B. Ed. course at Karmveer Hire Arts, Science, Commerce and Education college, Shri Mouni Vidyapeeth, Gargoti, Dist: Kolhapur.

The selected 60 student teachers have been further divided in two groups of 30 student teachers in each. The groups are called Experimental Group (E) and Control group(c). The researcher has used randomization method for this purpose. Both the groups have been treated differently.

3.2.0 DESIGN.

Research design is an arrangement of conditions for collection and analysis of data in a manner that combine relevance to the research purpose with economy in procedure. In fact the research design is the conceptual structure within which the research is conducted. It

consists a sort of blue print for the collection measurement and analysis of data. As such design includes an outline of what the investigator will do from writing the hypothesis and its operational implications to find analysis of data. The design used in this study has been represented as below:

Randomized Groups Pretest, Posttest Design:

Randomly Assigned	Pretest	Independent variable	Post Test
1. Experimental Group	T_1E	Teaching through AOM	T_2E
2. Control Group	T_1C	Teaching through TM	T_2C

DE = mean of the difference between experimental subjects.

Pretest and posttest scores (Gain scores.)

DC = mean of the difference between the control subjects

Pretest and posttest scores (Gain scores.)

Compare DE and DC to ascertain effect of teaching through AOM.

Ref: Chandra & Sharma 1997 – <u>Research in Education,</u> New Delhi, Atlantic publisher's & Distributors, P 374

In this experiment independent variables are

AOM & T.M.   Dependent variables are marks obtained by the student teachers

<u>Control</u>: there is no special training given to the student teachers. All the student teachers are from same surrounding i.e. form rural area (Gargoti)

3.3.0 SELECTION OF EXPERIMENTAL DESIGN

The selection of research design is naturally based upon the purpose of the research, the types of variables etc. the experimental design which is selected in this study has been selected as it is purely an experimental study. The Group E and Group C have been treated differently as per experiment in the Natural classroom setting. The subjects have been selected randomly. The steps of the experiment are as follows:

Randomly assigned:

Experimental Group	**Control Group**

Step I	Pretest	Pretest
Step II	Teaching through AOM	Teaching through TM.
Step III	Final Test	Final Test
Step IV	Comparison of gains in both the groups

Thus the same procedure could be stated as follows:

i) Securing equivalent Groups--   Randomly

ii) Pretest --   Pretest

iii) Applying the experimental factor for experimental

group.

iv) Applying Traditional method for control group.

v) Comparing the results (Gain scores.)

vi) Interpreting and reporting the result

Dependent variable : --   test score.

Independent variable – Teaching through AOM and TM.
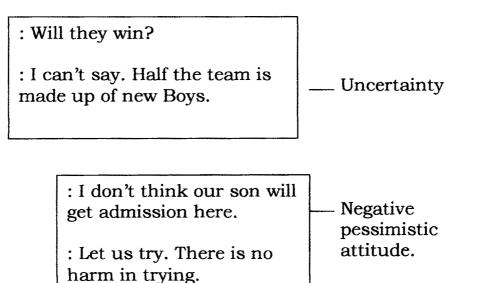
3.4.0 CONTENT TAUGHT.

3.4.1 EXPRESSING ATTITUDES AND OPINIONS.

I. You have to express your point of view on a variety of topics, and it is necessary that you should express yourself clearly and make a good impression on others. It is a leadership quality to be able to express in a clear and persuasive manner. For this you need Varity of expressions to state your views, to express approval or disapproval, agreement or disagreement in a reasonable and polite manner. It is a skill that can make you successful in your life. Learn these expressions by heart and make them part of your spoken as well s written use of language in a day-to-day life.

Read, for example, the following piece of conversation and the opinions expressed in it.

Seema:	What's the use of studying literature? There are so many other useful subjects we can study.	Raising an objection
Sunil:	What is being useful? <u>You seem to have</u> a very narrow idea of usefulness.	Counter-questioning
Sujit:	<u>I think</u> literature makes us understand the meaning of life.	Stating an opinion.
Sneha:	I <u>quite agree with you, in my opinion</u> through literature we learn to rise above petty joys and sorrows.	Supporting others and expressing agreement
Rajan:	<u>You mean,</u> it improves the quality of our mind.	Interpreting what others say.
Seema:	<u>The question is</u> how does it help us in getting a job?	Inviting attention to a specific problem.
Sneha:	<u>Look,</u> the purpose of education is not just getting a job. <u>In fact</u> it is not the purpose at all. <u>What do you say</u>, Sujit?	Making a strong opposite point. --Seeking opinion.
Sujit:	<u>I believe</u> the aim of education is to develop our personality and enrich our mind. And <u>in my opinion</u> literature plays the most important role in it.	Supporting, and stating, one's belief.
Seema:	<u>The truth</u> is you are all students of literature. So you have a strong bias for literature.	Expressing disagreement indirectly
Reena:	<u>I don't think so</u>, Sujit <u>has a good point</u> there. All fine arts enrich our mind.	Expressing disagreement supporting.

II. Like opinions, there can be different attitudes of looking at things. You have a positive attitude or negative, hopeful or despondent, encouraging or discouraging, etc. see for example:

: Will they win?
: I can't say. Half the team is made up of new Boys.

—— Uncertainty

: I don't think our son will get admission here.
: Let us try. There is no harm in trying.

—— Negative pessimistic attitude.

—— Hopeful optimistic

: He has actually got a distinction!
: Are you joking? He couldn't do simple problems.

—— Surprise/ disbelief.

Expressions of different attitudes:

Positive: hopeful	Negative: Pessimistic
1. Let us give it a try	1. It's no use trying
2. There is no harm in trying.	2. Nothing will come out of it.
3. I am quite hopeful about it	3. It is sheer waste of time.
4. Of course it will work.	4. He will never pass.
5. Never give up try again.	5. It is very difficult.
6.With a right approach, you can find a solution for it.	6. It's near impossible.
7. Some good will certainly come of it.	7. Leave it. You can't do it.
	8. This is the dead end. There is no way of it.

Certainty	Doubt: Uncertainty
1. I am quite sure of it	1. I am not sure he will come.
2. I am dead certain he will come	2. I very much doubt it
3. I have no doubt at all	3. Anything may happen.
4. There has got to be a bus	4. There could be a bus to go there. I can't say, for sure.
5. I am quite confident about it.	5. May be they will accept your proposal.

Joyful / Happy	Sad / Despondent
1. Wonderful!	1. How sad!
2. How lucky really!	2. I am very sorry to know it.
3. Bravo!	3. How unlucky he is!
4. I am so happy to know it.	4. I feel so helpless.
5. I am very glad that you have passed.	5. The situation is quite hopeless.
6. I don't know how to express my happiness.	6. Will this never end?

Encouraging	Discouraging
1. Go ahead, we are with you.	1. Think twice before you do it.
2. Continue you are on the right track.	2. It is too difficult for you.
3. And why not? You have every right to choose your career/ partner.	3. If I were you, I would not do it.
4. You are a girl, so what? You can do it. You have the ability.	4. It isn't a field for people like us.

Surprise

1. This is simply unbelievable!

2. I just can't believe it

3. Are you joking?

4. Really?

5. I am surprised that he came.

6. It's a pleasant surprise.

Task 1

A) State your opinion (negative or positive) on the following topics in a small paragraph.

a) Examinations   b) Noise pollution.   c) Violence in movies.

  Use the structures such as:

    I think that, I feel, I believe that .....

    The question is ....

    The point is ....

    I have to say that ....

    It is necessary that.....

B) Responds to the following questions/ statements / situations expressing your attitude as marked in the brackets. Write complete sentences.

1. Do you think India will win this match? (doubt. certainty)

2. I think we should form a theatre group. (Negative, positive)

3. Kenya has defeated Windies (surprise)

4. The train is late by two hours. (disgust, anger)

5. I would like to join a computer course. (encouraging)

6. Khan is in the hospital again. (sad and sympathetic)

7. Is there any other source for getting a loan? (Loss of hope, despondent)

8. Will he accept our invitation? (doubt)

9. Your friend has own the first prize in a debating competition. (Joy and happiness)

10. I would like to become an actor / actress. (discouraging.)

III. Criticizing, Suggesting, Explaining:

Opinions are stated sometimes with modifications. You modify them, add to them some more argument, illustrate them and so on. Let us see how it is done:

1. You state your opinion and then modify it:

   Science cannot be judged as moral or immoral But the means created by science can be used for moral or immoral purposes.

   Here but takes away some truth from the earlier statement.

   It expresses opposition. Other such devices are:

   However, yet, nevertheless.

There are number of science magazines. However most of them are in English and cannot benefit a large number of students.

2. You make a point and add something to it:

We need English for up-to-date knowledge in technology.

Moreover we need it for international communication. Other expressions of addition are:

Besides, in addition to, additionally, to add to it, ex-Physics in itself is a difficult subject. To add to it this textbook is written in very difficult style.

3. When you have a number of points to make you use expressions such as:

Firstly, secondly, thirdly, to begin with, next, another point is, finally, to conclude.

See for example:

There are number of reasons why we should study English. Firstly the higher education in science is only through English medium. Secondly new research in science is published in English all over the world. Thirdly nearly 80% journals in science and technology are published in English. Finally even for inter- state

communication in this country, we have to depend on English.

4. While expressing your point of view, you may agree with other people or disagree with them. You may not accept everything they say, but only some points. How do you express all this? See for example:

Agreement:

Co-education develops healthy understanding between boys and girls.

i)   That's quite true there cannot be two opinions about it.

ii)   I agree with you.

iii)   There is no doubt about it.

iv)   Yes, there is a sense in what you say.

Disagreement: (with the above statement)

i)   I am afraid, the matter is rather controversial.

ii)   I beg to differ with you.

iii)   I don't look at it the same way.

iv)   Do you really think so? I some how feel the system needs some improvement. Then it can work.

Agreement with unfavorable opinion:

Here you express your agreement with some sense of regret.

The film was quite boring.

i)   Yes <u>I am afraid it</u> was.

ii)   <u>I have to agree</u> that it was.

iii)   <u>To tell you the truth</u>, I slept through much of it.

iv)   <u>I can hardly disagree</u> with you.

Partial Agreement:

Here you may agree with one aspect of the argument, but disagree with some other aspect.

Our science syllabuses are fifty years old.

They need drastic change.

i) You may have a point there, but basic principles don't change.

ii) To some extent what you say is true your argument applies to college level in some respects.

iii) Yes, but you can't start straight way with Nuclear Physics, can you?

iv) You had better quality your statement. Which level are you talking about? And which particular branch of science?

Task 2:

Express your agreement, disagreement or partial agreement with the statements given below. Give your reasons also.

a) Television has badly affected reading habits of students.

b) There is no future for test cricket.

c) English should not be compulsory subject in colleges.

d) Terrorists should be treated sympathetically.

e) Films are responsible for the bad image of the police in India.

f) Examinations should not be held in the month of May.

g) Newspapers are responsible for creating public opinion.

h) Computers will create unemployment in our country.

i) Bombay is the best film by Maniratnam.

Exercises :

1. Write a paragraph on each of the following topics making use of appropriate expressions explained in this unit.

   a) Advantages and Disadvantages of Television.

   b) Sports should be made compulsory in the colleges.

   c) There should be internal examinations.

2. Write short pieces of dialogue between two friends on each of the following:

   a) Cable T.V. is a nuisance.

   b) India should not play cricket with Pakistan.

   c) The behavior of audience in the cricket stadium.

3.4.2 NEVER A PERFECT SPOUSE.

Johnnie Alves.

Worse than a wife who can cook and doesn't is the one who can't and does.

One has just got to accept right at the start that there's no such thing as a perfect marriage. marriages may be made in heaven, but they are contracts between two earthly beings with human faults, failings and what have you. You may have a prefect husband, but where

did it get me? I can also accept that there is such a thing as a near perfect wife but honestly; I've not met one yet. Being a good wife is not very difficult; all she has to do is run a house and please a husband but the opposite is well nigh impossible. No matter what I do, how hard I try; I have never been able to please my wife. Her demands flow like the never-ending stream from the Ganga's.

Therein lies the secret. Once you are convinced that you haven't married an angel but a human being like you, with equal or more faults, and then you have won half the battle. In marriage do not hitch your wagon to the stars. Don't except too much. Remember the case of Leslie. He met a doll and adored the ground on which she walked. Eventually he took her for better or for worse – and now she's taken him for everything. Poor John thought he was marrying a wife who was a good cook and he had visions of good home cooked meals. How disappointed he was when he realized that his mother-in-law was not there to help her. Now drink is the curse of his marriage. Once it made him shoot at her, it also made him miss.

Don't you believe her when my wife says, "we are happily married." The fact is she is happy and I am married. There is another thing you must remember. Don't fall for appearance and don't expect her good looks to last forever. Even if she does try, it will cost you half your earnings. Take the case of my friend Rui. He married a real runner. Before they were married, her chin was her best feature. Today it's a double feature. Her legs were the best any man had set his eyes on. Today they are not on talking terms. When men fall in love, they expect their happiness to last forever. Madhu rushed in to marriage expecting too much. Now he doesn't have to worry about making a fool of himself- she is doing a job for him.

As Dennis Weaver once said, "Most people go into this marriage business with an extraordinary kind of dream that some how its going to change everything, and its going to be perfect and take them into a world of perpetual bliss."

When you plan to get into marriage you must understand that no person can completely satisfy you. That where Mario went wrong. He was a happy – go-

lucky fellow and he met a girl who he taught would share his happiness. Before he was married he was an atheist and didn't believe in hell. So he enjoyed himself. Now she is convinced him that he was wrong.

Don't expect to be automatically happy ever after. Get in to marriage fully prepared for the squalls and you will be able to adjust yourself. If you feel that you do not have the capacity to be to bear with the faults of others, if you want your partner to be perfect like yourself, then please don't marry. Don't be like my friend Nelly. This is her third marriage. She never loses an opportunity to make some man miserable.

And for Christ's sake don't marry to find out your partners qualities. Find them out before marriage. The other day Usha said, "I had to marry to find out how stupid you are." Her husband replied, "you should have known that the moment I asked you."

And don't be foolish enough to marry hoping to change the girl. If she won't change before marriage, she won't change after. Tino married Caroline hoping she'd change. Now she is happily married. Her latest boyfriend likes her husband.

3.4.3 THE INDIAN SERENADE

P.B. Shelley

I

I arise from dreams of thee

In the first sweet sleep of night,

When the winds are breathing low

And the stars are shining bright:

I arise from dreams of thee,

And a spirit in my feet

Hath led me – who knows how?

To thy chamber windows, sweet!

II

The wandering airs they faint

On the dark, the silent stream-

The Champak odours fail

Like sweet thoughts in a dream;

The nightingales complaints,

It dies upon her heart: -

As I must know thine,

Oh, beloved as thou art!

III

Oh lift me from the grass!

I die! I faint! I fail!

Let thy love in kisses rain

On my lips and eyelids pale.

My cheek is cold and white, alas!

My heart beats loud and fast: -

Oh! Press it to thine own again.

here it will break at last.

3.5.0 TOOLS OF THE STUDY.

In order to draw the conclusion from an experimental research, the researcher has used following two tools: -

1. The achievement test, which is proficiency test used to ascertain what and how much has been learnt and how well a task can be performed by an individual before and after a period of training or learning, in the subject "English for communication."

2. T-test for finding significance of the study at 0.01 level and 0.05 level

3.6.0 MEASURE OF ACHIEVEMENT.

The achievement of the student teachers in pre and post test has been measured with the help of an achievement test developed by researcher. Both pre and post tests were consisted of 50 marks and one and half hour duration of time to solve. The tests were consisted of 5 questions carrying ten marks each. The questions were followed with sub-questions and internal alternatives for some sub questions. The following steps were followed while developing the test:

Step I:

The first step of the test construction was to give weightage to the content taught. The researcher has given 60 % weightage to the section first, communications skills and 40 % to the section two, reading comprehension. The weightage was given as per the university question paper pattern as follows:

Table 3.1 : Weightage to the content.

Content	Marks	Weightage
Section I a) Communication skills Section II Reading comprehension	30	60
b) Prose	10	20
c) Poetry	10	20
Total	50	100

Step II:

The second step of the test construction was to give weightage according to objectives as per Bloom's Taxonomy of Educational objectives as such:

Table 3.2 Weightage to objectives:

Objectives	Marks	Weightage in percentage
1) Knowledge	5	10
2) Comprehension	11	22
3) Application	10	20
4) Analysis	4	08
5) Synthesis	15	30
6) Evaluation	5	10
Total	50	100

Step III:

In the third step the researcher has given weightage to the difficulty level because a test should provide suitable opportunity to the bright, the normal and the weak student in the class. The intention here is that all the items in the test should not be very difficult or very easy:

Table 3.3 Weightage to Difficulty level.

Difficulty	Marks	Percentage
1) Easy	15	30
2) Average	20	40
3) Difficult	15	30
Total	50	100

Step IV:

Weightage to different forms of questions in testing various learning outcomes the essay type, short answer type and the objective type questions may be judiciously used. Weightage to different forms of questions should be decided. The weightage is tabulated as:

Table 3.4 : Weightage to type of questions.

Types of questions	No. of questions	Marks	Weightage
1) Objective type	5	5	10
2) Short answer type	12	20	40
3) Essay type	4	25	50
Total	21	50	100

Step V : The Blue print:

The researcher has framed a blue print, which is a three-dimensional chart showing the weightage given to objectives, sub unit content and forms of questions in terms of marks. The blue print serves many purposes; it may help to improve the content validity of teacher. It defines as clearly as possible, the scope and emphasis of the test. It relates objectives to the content. It provides greater assurance that the test will measure learning outcomes and a course content in a balanced manner. The blue print is given below:

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Table 3.5 Blue Print

	Knowledge O S E	Understanding C comprehension O S E	Application O S E	Analysis O S E	Synthesis O S E	Evaluation O S E	Total
C. S			5(5) 5(1)		15 (2)	5 (2)	30 (10)
Prose	5 (5)	5 (1)					10 (6)
Poetry	·	6 (3)		4 (2)			10 (5)
		6(3) 5(1)	5(5) 5(1)	4(2)	15(2)	5(2)	
Grand Total	5(5)	11(4)	10(6)	4(2)	15(2)	5(2)	50(21)

* Figures in the brackets indicate number of questions
* figures out of brackets indicate Marks.

3.7.0 QUESTION PAPER.

Max.marks :50   **Time : 1.30. Min.**

Q. No. 1	(a) Use the following structures and state your opinion (negative or positive) on one of the topic given as under. I think that, I feel, I believe that---, The question is, The point is, I have to say that, It is necessary that. Topics a) Examinations b) Water Pollution c) Violence in J. & K.	5
	(b) Respond to the following questions / statements / situations expressing your attitude as marked in the brackets. Write complete sentence i) India has defeated Pakistan (surprise) ii) Will he accept our invitation? (doubt) iii) The Bus is late by one hour. (disgust, anger) iv) I would like to become an actor / actress. (discouraging.) Khan is in the hospital again. (sad and sympathetic)	5
Q. No. 2	(a) Express your agreement, disagreement or partial agreement with statements given below. (any two) i) Bombay is best film by Maniratnam. ii) There is no future for test cricket. iii) English shouldn't be compulsory subject.	5

	(b) Write short pieces of dialogue between two friends on "Cable T.V. is a nuisance."	5
Q. No. 3	Write an essay on any one of the two by using appropriate expressions explained in unit 8 of your textbook. 1) Advantages and Disadvantages of Television. 2) Sports should be made compulsory in the colleges.	10
Q. No. 4	(a) Write a paragraph on Do's and Don'ts in marriage.	5
	(b) Match words from list 'A' with meanings from list 'B'	5
	<table><tr><td>(A)</td><td>(B)</td></tr><tr><td>1. atheist.</td><td>a) A married person.</td></tr><tr><td>2. squalls.</td><td>b) Care free</td></tr><tr><td>3. Perpetual</td><td>c) Screams.</td></tr><tr><td>4. happy-go-lucky.</td><td>d) Unbeliever.</td></tr><tr><td>5. spouse.</td><td>e) everlasting.</td></tr></table>	
Q. No. 5	Answer the following questions. 1. Does the poet have a silent sleep, if not why? 2. What does the poet ask his beloved to do? 3. What will happen if the beloved does not respond to his love? 4. Point out the figures of speech used in the poem. 5. Pick out the adjectives used in the poem.	10

3.8.0 DATA COLLECTION.

For testing the hypothesis the researcher has conducted pre and post tests in both the Groups E and C to measure the achievement of student teachers in English for communication. The collected data is tabulated as follows.

Table 3.6 Experimental Group

Sr. No	Name Of The Student	X_1	M_1	$\underline{x - m}$ x	X^2
1	Magadum Aruna Jayawant	32	24.71	7.32	53.58
2	Jamgund Sunita Challapa	24	24.71	-0.68	0.46
3	Patil Sharda Pandurang	31	24.71	6.32	39.94
4	Shinde Santosh Tukaram	25.5	24.71	-0.18	0.03
5	Bhandare Rekha Padurang	18	24.71	-6.68	44.62
6	Mulla Firoz Appaso	15	24.71	-9.68	93.7
7	Kamble Prashant Kisanrao	16	24.71	-8.68	75.34
8	Jadhav Kalpana Vijay	34	24.71	9.32	86.86
9	Bhosale Subhas Keshav	38	24.71	13.32	177.42
10	Shinde Balkrishna Baburao	39	24.71	14.32	205.06
11	Kumbhar Prabhakar Pandurang	15	24.71	-9.68	93.7
12	Mane Karuna Dayanand	37	24.71	12.32	151.78
13	Mane Seema Shivajirao	15	24.71	-9.68	93.7

14	Vanmane Bhujang Trimbak	23	24.71	-1.68	2.82
15	Awale Balaso Dhondiram	16	24.71	-6.68	44.62
16	Deshmukh Balaji Haridas	34	24.71	9.32	86.86
17	Kamble Reshma Maruti	24	24.71	-0.68	0.46
18	Khandekar Gajanan Jotiba	19.5	24.71	-5.18	26.83
19	Tipugade Shrikant Pandurang	12	24.71	-12.68	160.78
20	Gheware Yougiraj Ramkrishna	22	24.71	-2.68	7.18
21	Salokhe Sattapa Raghunath	25	24.71	0.32	0.10
22	Khose Shrikant Hanumant	20	24.71	-4.68	21.9
23	Musal Shrikant Bira	35	24.71	10.32	106.5
24	Kumbhar Shakuntala Dashrath	21	24.71	-3.68	13.54
25	Sule Sukeshani Nagnath	29	24.71	4.32	18.66
26	Bhadvankar Minakshi Annapa	23.5	24.71	-1.18	1.39
27	Patil Savita Sadashiv	24	24.71	-0.68	0.46
28	Jadhav Priyanka Ananda	17	24.71	-7.68	58.98
29	Gawas Neeta Dattram	23	24.71	-1.68	2.82
30	Dhekale Savita Ananda	34	24.71	9.32	86.86
		24.68		$\frac{0.62}{30}$	1757.18

$M_1 = \dfrac{741.5}{30} = 24.71$

$d_1 = 96.19$

$- \underline{95.62}$

0.62

$\sum x^2_1 = 1757.18$

Table 3.7 Control Group

Sr. No	Name Of The Student	X_2	M_2	$\dfrac{x - m_2}{x}$	X^2
1	Sonawane Pandurang Tukaram	11.5	14.5	-3	9
2	Bhise Satish Babasaheb	7	14.5	-7.5	56.25
3	Dalvi Shantaram Sakharam	15	14.5	0.5	0.25
4	Davari Prakash Shripati	13	14.5	-1.5	2.25
5	Devekar Sarika Shivaji	9	14.5	-5.5	30.25
6	Gawali Damyanti Dinkar	10	14.5	-4.5	20.25
7	Khabole Deepak Dattu	2	14.5	-12.5	56.25
8	Gurav Surekha Ganpati	10	14.5	-4.5	20.25
9	Kamble Manisha Shankar	12	14.5	-2.5	6.25
10	Garole Savita Durgaji	8	14.5	-6.5	39.25
11	Kudtarkar Savita Bhikaji	20	14.5	5.5	30.25
12	Kamble Joyti Divakar	26.5	14.5	12	144

13	Karande Ganesh Narayan	18	14.5	3.5	12.25
14	Patil Vihar Annaji	10	14.5	-4.5	20.25
15	Mangule Vithal Narayan	16.5	14.5	2	4
16	Mohite Kashinath Gangadhar	20	14.5	5.5	30.25
17	Kumbhar Supriya Laxman	12	14.5	-2.5	6.25
18	Kamble Arjun Tanaji	10	14.5	-4.5	20.25
19	Powar Vijayarani Mahadev	13	14.5	-1.5	2.25
20	Hajare Harsha Shamrao	24	14.5	9.5	90.25
21	Suryavanshi Pushpa Asharappa	12	14.5	-2.5	6.25
22	Hujare Rani Dagadu	11.5	14.5	-3	9
23	Shinde Mahadev Zajogi	14.5	14.5	0	0
24	Mane Santosh Banderao	16	14.5	1.5	2.25
25	Shivangekar Arjun Narayan	13	14.5	1.5	2.25
26	Ugadekar Sheetal Suresh	18	14.5	3.5	12.25
27	Metagar Joyti Shivanand	20	14.5	5.5	30.25
28	Bashetti Sattanram D.	15	14.5	0.5	0.25
29	Mahaldar Aprana Ravindra	23	14.5	8.5	72.25
30	Lad Ranjeet Ishwara	11	14.5	-3.5	12.25
		14.5		$\frac{1.3}{30}$	747.25

$M_2 = \dfrac{421}{30} = 14.05$

$d_2 = \begin{array}{r} -7.5 \\ +\ \underline{5.8} \\ -1.3 \end{array} \qquad = \dfrac{1.3}{30} = 0.43$

$\Sigma x^2{}_1 = 747.25$

3.9.0 Statistical Analysis Used.

To test the significance of difference among the gain scores of achievement, the researcher has used following statistical analysis.

Degrees of freedom

$= (N_1 - 1) + (N_1 - 1)$

$= (30 - 1) + (30 - 1)$

$= \qquad 29 + 29$

$= \qquad 58$

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sum x_1^2 + \sum x_2^2}{(N_1 + N_2 - 2)}\left(\frac{N_1 + N_2}{(N_1 N_2)}\right)}}$$

$$= \frac{24.68 - 14.03}{\sqrt{\frac{\sum x_1^2 + \sum x_2^2}{(30+30 - 2)}\left(\frac{30 + 30}{30 \times 30}\right)}}$$

$$= \frac{10.65}{\sqrt{\frac{\sum x_1^2 + \sum x_2^2}{58}\left(\frac{60}{900}\right)}}$$

$$= \frac{10.66}{\sqrt{\frac{1757.18 + 747.25}{58 \times 15}}}$$

$$= \frac{10.66}{\sqrt{\frac{2504.43}{870}}}$$

$$= \frac{10.66}{\sqrt{2.87}}$$

$$= \frac{10.66}{1.69}$$

$$t = 6.30$$

Table 3.8 t – value

T value	0.01 level	0.05 level	Remark
Calculated	6.04	6.14	S
Table Value	2.66	2.0	S

M_1 and M_2 = means of two samples

Σx_1^2 + Σx_2^2 = sums of squares in two samples

N_1 + N_2 = number of cases in two samples

S   = Significant.