CHAPTER III

DESIGN OF THE STUDY

• Introduction

• Tools used for the study

• Sampling procedure

• Data-Gathering procedure

• Statistical techniques used.
The magnitudinal problem for the investigator is to decide over numerous methods, designs and procedure which are to be adopted for procuring better results of investigation. Methodology is of course a generalisation of techniques and a concretisation of conducting research in the area of education. It is related to various techniques which are used by the researcher in highlighting the weak points and good points related to research. In other words, it deals with the resources and limitations of general research methods such as observation, interview, questionnaire, opinionnaire and other experimental tools. In fact once the operational part is countenanced, the useful results can be yielded from the investigation which form the basis of any research that would go a long way to help the society for its development. John W. Best (1963) is of the view that research is a more formal systematic and intensive process of carrying on a scientific method of analysis to highlight the meaningful results.

Buch (1987) noted that in a country like India where demands out weigh resources then, streamlining the flow of amenities to different research activities becomes important. Consequently it is recognised that the methodology, design procedure for any kind of educational research is profoundly essential in order to develop the pursuit of excellence in the investigator and to deduce better results pertaining to the investigation. The investigator ventured to undertake a problem on current educational area namely the distance education.

Since the problem is concerning to new educational system in India it is better to know the effectiveness of the same with that of already available formal educational system. As we have already discussed open learning through distance education is gaining more and more popularity in different parts of India.
there are more number of open universities established in every state of the country. The open universities have started Science and Technical courses which are more abstract and needs continuous work and skills. So the investigator wanted to know whether the B.Sc. physics course of IGNOU is effective in nature and wanted to compare the same with the traditional B.Sc. physics course in different universities of Karnataka state. For this purpose the investigator developed many tools and used them with particular techniques on a sample chosen for the study. The description of which is given in the preceding lines.

**Tools Used for the Study**

The problem under study is mainly aimed at comparison of B.Sc. physics course in two type of set ups. The main area which are to be considered are as follows.

1) Infrastructure

2) Admission Procedure

3) Course Content

4) Methodology of Teaching -Learning Process.

5) Library Facilities.

6) Laboratory Facilities.

7) Co-curricular Activities

8) Evaluation and Results and Awards

9) Special Set Up.
Considering the above facts the investigator along with the guide consulted many experts, teachers, friends both in the field of open universities and conventional colleges arrived at a conclusion to prepare the following tools to know the different aspects of the above areas mentioned. The following are the tools prepared commonly for both IGNOU and Conventional Colleges.

I) Questionnaire for B.Sc. Physics Course Students of IGNOU and Conventional Colleges.

II) Questionnaire for IGNOU Physics Counsellors and Conventional College Teachers Teaching Physics.

III) Questionnaire for the Coordinators of IGNOU and Principals of conventional colleges.

IV) Opinionnaire for Regional Director of IGNOU and Management of the Conventional Colleges.

V) Observation Schedule to Observe the Teaching Process.

VI) Opinionnaire for IGNOU Students.
Description of the Tools

I. Questionnaire for B.Sc. Physics Course Students of IGNOU and Conventional Colleges.

This tool is prepared to know the various aspects like facilities provided for the B.Sc. physics course students human and material resources available and other administrative aspects with a view to obtain the facts about the following aspects.

1) Material and Human resources available.
2) Admission Procedure.
3) Syllabus
4) Teaching-Learning Process
5) Library Facilities.
6) Physics Experiments conducted.
7) Co-curricular activities.
8) Examination System and Award of degrees.
9) Other Specialities.

The tool was prepared mainly to know the responses of the students of both IGNOU and Conventional colleges. The questions are open ended questions and were constructed commonly for both the type of students keeping in view of getting exact responses for the above aspects in a specific manner 'Yes' or 'No' type, some questions are descriptive type.
At the first instance the investigator constructed 160 items and showed them to the guide and various other experts and personnel. A sum of 140 items were selected for the pilot study. The pilot study was undertaken on a sample of students of conventional colleges and the distance learners. The sample questions include the following types namely.

Sample questions: Please tick the following or write in one or two words

A. Do you like the present examination system? Yes / No
B. Whether the syllabus is covered well in time? Yes / No

If No, what alternative step is taken to complete the syllabus, please mention in one or two words.

After undertaking the pilot study some questions were removed and finally 125 items were taken up and hence the results revealed that the questionnaire was effective.

Standardisation Procedure

The tool was standardised by test-retest method. It has content validity and construct validity. The reliability coefficient calculated was 0.85. Hence the questionnaire was retained for final data collection (Appendix - I).

II. Questionnaire for IGNOU Physics Counsellors and Conventional College Teachers Teaching Physics

This tool is prepared to know the various aspects like the facilities provided for the B.Sc. physics subject teachers, about human and material resources available and other administrative aspects with a view to obtain the facts about the following aspects.
1) Building and other essential facilities

2) Students participation

3) Course content

4) Methodology of teaching - learning process

5) Library facilities.

6) Laboratory set up.

7) Conduct of Co-curricular activities.

8) Evaluation system and results and awards.

9) Special set up.

The tool was prepared to know the responses of both IGNOU PHE counsellors and conventional college teachers about the B.Sc. physics course. The questions consisted of open-ended like, 'yes' or 'No' type, and one or two descriptive type wherein the respondent will elicit correct responses to the questions. The questions were so framed keeping in view of getting exact responses for the above aspects in a specific manner.

At the first instance the investigator constructed 150 items and showed them to the experts, guide, friends and other personnel of both conventional college and open universities. A sum of 120 items were selected for the pilot study. The pilot study was undertaken on a sample of teachers of both conventional college and counsellors of open university.
After completing the pilot study some questions were eliminated and some were restructured and finally 85 items were taken up and hence the result revealed that the questionnaire was effective.

Standardisation Procedure

The tool was standardised by test-retest method. It has content validity and construct validity. The reliability coefficient calculated was 0.78. Hence the test was retained for final data collection (Appendix- II).

III Questionnaire for the Co-ordinators of IGNOU and Principals of Conventional Colleges.

This tool is prepared for co-ordinators / principals to know the various facilities available for the students and teachers of B.Sc. physics course for both the IGNOU and conventional college with respect to human and material resources and other administrative aspects with a view to obtain the facts about the following aspects.

1) Physical facilities available.

2) Students admission and fee structure.

3) Course content and syllabus.

4) Methodology of teaching - learning process

5) Library facility

6) Laboratory facilities available for physics students and teachers.

7) Co-curricular activities.
8) Examination system

9) Evaluation and results and awards

10) Special set up

The tool was prepared to know the responses of both IGNOU coordinators and the conventional college principals about the B.Sc. physics course. The question mainly consisted of open ended type like ‘Yes’ or ‘No’, some are descriptive type wherein the respondents will answer exactly to the questions. The questions were so framed keeping in view of getting exact responses for the above aspects in a specific manner.

At the initial stage the investigator constructed 150 items and showed them to the guide and various other experts of both conventional and open universities. A sum of 120 item were selected for the pilot study. The pilot study was undertaken on a sample of coordinators and principals of both open universities conventional colleges.

After completing the pilot study some questions were eliminated and some were restructured and finally 85 items were taken up and hence the result revealed that the questionnaire was effective.

Standardisation procedure

The tool was standardised by test-retest method. It has content validity and construct validity. The reliability coefficient calculated was 0.84 and hence the test was retained for final data collection (Appendix - III).
Opinionnaire for IGNOU Students

The investigator prepared this tool to know the opinion of the students of IGNOU regarding the B.Sc. physics course. The researcher wanted to know the opinion as to what they have responded in the questionnaire keeping in view the objectives, physics syllabus some questions were framed with a view to obtain the facts about the following aspects.

1) Social setup.

2) Community life.

3) Content organisation.

4) Methodology of teaching - learning process

5) Books and Journals.

6) Experimental work.

7) Sports and games.

8) Results

These contain questions of open ended questions, 'yes' or 'No' type, tick mark and one or two descriptive type wherein the respondents will answer exactly for the above aspects in a specific manner.

At the initial stage there were 70 questions wherein the investigator showed them to the guide and other experts of IGNOU and conventional colleges. A sum of 55 items were selected for the pilot study. The pilot study was undertaken on a sample of students of B.Sc. course of both conventional colleges and IGNOU.
After completing the pilot study some questions were eliminated and finally 36 items were taken up and hence the result revealed that the opinionnaire was effective. The tool contained the essential aspects of IGNOU B.Sc. physics course and hence it has content validity and construct validity (Appendix -VI).

Opinionnaire for Regional Director of IGNOU and Management of the Conventional Colleges.

This tool is prepared to know the various facilities available for the students teachers and other staff of B.Sc. physics course for both the IGNOU and conventional colleges with respect to human and material resources and other administrative aspects with a view to obtain the facts about the following aspects.

1) Infrastructure

2) Admission procedure

3) Course content

4) Methodology of teaching - learning process .

5) Library facilities.

6) Laboratory set up.

7) Co-curriculum

8) Evaluation and results and awards

9) Special set up.
The tool was prepared to know the responses of both the IGNOU Regional Director and the Management of the conventional colleges regarding the B.Sc. physics course. The questions mainly consisted one or two descriptive type wherein the respondents will answer exactly to the questions. The questions were so framed keeping in view of getting exact responses for the above aspects in a specific manner.

At the initial stage the investigator constructed 150 items and showed them to the guide and various other experts of both open universities and conventional colleges. A sum of 120 items were selected for the pilot study. The pilot study was undertaken on a sample of Regional Director and Management of both open universities and conventional colleges.

After completing the pilot study some questions were eliminated and finally 85 items were taken up and hence the result revealed that the opinionnaire was effective.

Standardisation Procedure

The tool was standardised by test-retest method. It has content validity and construct validity. The reliability coefficient calculated was 0.84. Hence the test was retained for final data collection (Appendix - IV).

Observation Schedule

The investigator developed a common schedule to know the various techniques adopted in IGNOU and conventional B.Sc. physics theory and practical classes. The researcher visited all the three study centres personally during the counselling session and observed the lessons of the counsellors in the
classroom. So also the investigator visited all the twelve conventional science colleges and observed the teaching-learning process carried on in the classroom. The questions were so framed keeping in mind the objectives, syllabus and review of related literature.

These are containing questions of (Tick \( \checkmark \)) mark where in the observer has to tick to the correct answers. The investigator is herself the observer of the classroom activities going on between the teaching-learning process.

The observation schedule contains 16 items. Each item has been rated on the 5 point scale like Weak, Below Average, Average, Good and Excellent. The grades have been given like A,B,C,D,E, where

- A - 80 & above
- B - 60 to 79
- C - 40 to 59
- D - 20 to 39

Earlier there were 38 items, the tool was standardised by pilot study and also by approaching experts, research scholars and others but after standardisation the tool was having 16 items.

The tool is being contained questions about the teaching process of two types of institutions, hence it has content validity and construct validity. The reliability was also calculated by test-retest method which was calculated as 0.79 and hence the observation schedule was used for final data collection (Appendix-V).
Sampling Procedure

The study under consideration needs sampling since both aspects are containing large population area.

I) IGNOU study centres in (Karnataka & Goa region)

a) Students studying B.Sc. physics course.

b) Counsellors counselling B.Sc. physics subject.

c) Co-ordinators

II) Conventional colleges B.Sc. physics

a) Students belonging to six universities in Karnataka studying physics subject for the degree level.

b) Teachers teaching physics for the degree level.

c) Principals of all such colleges.

In Karnataka state there are two study centres of IGNOU conducting B.Sc. physics course. They are J.S.S. study centre, Dharwad and the other one is Government science college, Bangalore. One more study centre located at Panaji-Goa which is included in Karnataka region. So all the three study centres come under one region that is Karnataka and Goa region.
a) IGNOU Sample

Following table shows the names of the study centres and the number of students studying B.Sc. physics course at IGNOU.

Table: 6 - showing the name of the study centre its place and total number of students studying B.Sc. physics course at IGNOU during the year 1999.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Study Centre</th>
<th>Place of study centre housed</th>
<th>Total number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dharwad J.S.S. college</td>
<td>vidyagiri, Dharwad</td>
<td>B.Sc.-I</td>
</tr>
<tr>
<td></td>
<td>06 12 11 = 29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Bangalore Government Science College</td>
<td>N.R.Circle, Bangalore.</td>
<td>118 48 26 = 192</td>
</tr>
<tr>
<td>3.</td>
<td>Goa (Panaji) Arts and Science Miramer, Panaji Goa.</td>
<td>59 31 17 = 107</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grand Total = 183 91 54 = 328</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The selection of students from IGNOU B.Sc.-I,II and III or is follows. From Dharwad study centre all the 29 students were purposively chosen since they were very less in number. So also all the 107 students studying at Goa study centre were chosen. But in Bangalore study centre there were 192 students studying B.Sc. course. Out of which 114 physics students were randomly selected for the sample. So in all 250 students were chosen for the study.
b) Selection of Physics Counsellors

Table 7: Showing the name of the Study Centre, number of Physics Counsellors working in different IGNOU study centres and the sample chosen for the study.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the study centre</th>
<th>Total number of PHE(Physics) Counsellors</th>
<th>Counsellors chosen for study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dharwad</td>
<td>08</td>
<td>08</td>
</tr>
<tr>
<td>2.</td>
<td>Bangalore</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>Goa(Panaji)</td>
<td>06</td>
<td>06</td>
</tr>
<tr>
<td></td>
<td>Total = 24</td>
<td>Total = 24</td>
<td></td>
</tr>
</tbody>
</table>

Since the number of counsellors counselling PHE -physics subject for B.Sc. course of IGNOU are very meagre and hence all are included in the sample.

c) Coordinators

Every IGNOU study centre is headed by an experienced teaching person known as co-ordinator. So the co-ordinators of all the three study centres were included in the study.

Conventional colleges sample

The second aspect of sampling is selection of sample for the conventional colleges.

Karnataka state is a very big state wherein six universities are established. Each university is having number of science degree colleges where physics is studied as one of the optional subjects.
Following table shows the name of the six conventional universities and number of science colleges wherein physics is studied as one of the subjects at degree level.

**Table : 8 - Showing the six conventional universities and the number of science colleges.**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the six conventional universities</th>
<th>Number of science colleges where physics is studied as one of the subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bangalore</td>
<td>123</td>
</tr>
<tr>
<td>2.</td>
<td>Gulbarga</td>
<td>28</td>
</tr>
<tr>
<td>3.</td>
<td>Karnataka</td>
<td>52</td>
</tr>
<tr>
<td>4.</td>
<td>Kuvempu</td>
<td>23</td>
</tr>
<tr>
<td>5.</td>
<td>Mangalore</td>
<td>26</td>
</tr>
<tr>
<td>6.</td>
<td>Mysore</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td><strong>291</strong></td>
</tr>
</tbody>
</table>

It clearly shows that there are 123 science colleges in the Bangalore University, 28 colleges in Gulbarga university, 52 colleges in Karnataka university, 23 colleges in kuvempu university, 26 colleges in Mangalore University and 39 colleges in Mysore university. Totally there are 291 Degree science colleges in Karnataka State.
Table :9- Showing the name of six conventional universities and the two science degree colleges chosen from each university.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of the six universities</th>
<th>Name of the science degree colleges chosen for the study.</th>
<th>Total colleges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Bangalore</td>
<td>a) Government science college 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.R.Circle, Bangalore,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Venkatappa college of arts, science 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>and commerce college Chikkaballapur.</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td>Gulbarga</td>
<td>a) Vijayanagar college, Hospet 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Veerashaiva college, Bellary 01</td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td>Karnataka</td>
<td>a) J.S.S.College, Vidyagiri, Dharwad 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) G.H.College, Haveri 01</td>
<td></td>
</tr>
<tr>
<td>4)</td>
<td>Kuvempu</td>
<td>a) S.B.College, Sagar 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Sahyadri college, Shimoga 01</td>
<td></td>
</tr>
<tr>
<td>5)</td>
<td>Mangalore</td>
<td>a) M.G.M college Udupi 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Yenu poya college of arts and science01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mangalore.</td>
<td></td>
</tr>
<tr>
<td>6)</td>
<td>Mysore</td>
<td>a) Yuvarajas' college , Mysore 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Arts and science college , Mandya 01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Grand Total</strong> <strong>12</strong></td>
</tr>
</tbody>
</table>

Table 9 clearly shows that two science degree colleges are chosen from six conventional universities in Karnataka state. So in all the 12 colleges have been randomly chosen for the present study.
Selection of students

Following table shows the name of the science degree colleges, total number of students and number of students chosen studying B.Sc. physics course.

Table: 10 - showing the name of the science degree colleges, total number of students studying B.Sc.-I, II and III and number of students chosen studying B.Sc. physics course for the study.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the science degree colleges</th>
<th>Total number of B.Sc. students studying</th>
<th>Students chosen</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B.Sc.I</td>
<td>B.Sc.II</td>
<td>B.Sc.III</td>
</tr>
<tr>
<td>a)</td>
<td>Government science college</td>
<td>150</td>
<td>120</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>N.R.Circle, Bangalore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>Venkatappa college of arts, science &amp; commerce college</td>
<td>120</td>
<td>95</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Chikkaballapur</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>Vijayanagar college, Hospet</td>
<td>90</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>b)</td>
<td>Veersaiva college, Bellary</td>
<td>110</td>
<td>85</td>
<td>70</td>
</tr>
<tr>
<td>a)</td>
<td>J.S.S. college, Dharwad</td>
<td>140</td>
<td>108</td>
<td>75</td>
</tr>
<tr>
<td>b)</td>
<td>G.H. college, Haveri</td>
<td>80</td>
<td>65</td>
<td>45</td>
</tr>
<tr>
<td>a)</td>
<td>S.B. college Sagar</td>
<td>85</td>
<td>52</td>
<td>40</td>
</tr>
</tbody>
</table>
It clearly shows that 21 students studying B.Sc. physics course were chosen from each science degree college. So in all 250 students were chosen randomly from 12 science degree colleges of 6 universities in Karnataka state.
### d) Selection of Physics Teachers

Table: 11- Shows the name of the college, total number of physics teachers and the sample chosen.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of the university</th>
<th>Name of the college</th>
<th>Total no. of physics teachers teaching</th>
<th>Physics teachers chosen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Bangalore</td>
<td>a) Government science college N.R.circle, Bangalore</td>
<td>15</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Venkatappa college of arts, science &amp; commerce college ChikkaBallapur.</td>
<td>11</td>
<td>02</td>
</tr>
<tr>
<td>2)</td>
<td>Gulbarga</td>
<td>a) Vijayanagar college, Hospet,</td>
<td>08</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Veersaiva college, Bellary</td>
<td>10</td>
<td>02</td>
</tr>
<tr>
<td>3)</td>
<td>Karnataka</td>
<td>a) J.S.S. college, Dharwad</td>
<td>12</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) G.H.college, Haveri</td>
<td>08</td>
<td>02</td>
</tr>
<tr>
<td>4)</td>
<td>Kuvempu</td>
<td>a) S.B.college Sagar</td>
<td>06</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Sahayadri college, Shimoga</td>
<td>10</td>
<td>02</td>
</tr>
<tr>
<td>5)</td>
<td>Mangalore</td>
<td>a) M.G.M.college, Udupi</td>
<td>08</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Yenupoya college, Mangalore</td>
<td>10</td>
<td>02</td>
</tr>
<tr>
<td>6)</td>
<td>Mysore</td>
<td>a) Yuvaraja’s college, Mysore</td>
<td>09</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Arts and science college, Mandya</td>
<td>07</td>
<td>02</td>
</tr>
</tbody>
</table>

Grand Total | 114 | 24

It clearly shows that there are 114 physics teachers teaching in all the twelve colleges. The researcher has chosen 24 teachers randomly as the sample for study.
It is quite obvious that all the principals of the twelve science colleges chosen for the study were included for the present study.

Table 12- shows the total sample included in the study are summed up as follows:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>B.Sc. Physics Course</th>
<th>Total B.Sc. study centres / Conventional colleges</th>
<th>Total Students chosen</th>
<th>Physics Counsellors/ Teachers</th>
<th>Co-ordinators/ Principals'</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>IGNOU (Karnataka &amp; Goa)</td>
<td>03</td>
<td>250</td>
<td>24</td>
<td>03</td>
</tr>
<tr>
<td>II.</td>
<td>Conventional Colleges (Karnataka)</td>
<td>12</td>
<td>250</td>
<td>24</td>
<td>12</td>
</tr>
</tbody>
</table>

It clearly shows that three B.Sc. study centres are chosen from Karnataka and Goa region with total number of students chosen with PHE-(Physics) subject were 250, the PHE counsellors were 24 and all the three coordinators were chosen for the study from IGNOU.

Similarly twelve science colleges, 250 students with physics subject at degree level, 24 physics teachers and all the twelve principals were included for study from the conventional colleges in Karnataka.

**Data Gathering Procedure**

The data gathering procedure was adopted following three phases.

I Phase

Data gathering from three IGNOU B.Sc. study centres

II Phase
Data gathering from twelve selected science degree colleges.

III Phase

Observation of teaching learning process in both the set ups

The investigator during the first phase visited all the three study centres conducting B.Sc. course in Karnataka and Goa region.

They are namely as follows

a) Dharwad

b) Bangalore and

c) Goa [Panaji]

The investigator gathered the addresses of the students and counsellors of B.Sc. physics course from the coordinator of the respective study centre and posted the questionnaires. Before administering the questionnaire to the students counsellors and the coordinators, the purpose was explained to them. The researcher also visited personally and administered the questionnaire during the counselling session, term-end examination and laboratory session and collected the responses of the students, counsellors and the co-ordinators.

Similarly the opinionnaire was given to physics students to know as to what they have answered in the questionnaire. So also the opinionnaire was given to the Regional Directors of IGNOU as to elicit how they are managing and administering the B.Sc. course and also collected the opinion of the B.Sc. physics course. So the researcher collected the data in the above mentioned manner from the students, physics counsellors, coordinators and the director of regional centres of karnataka and Goa region regarding the B.Sc. physics course.
During the second phase, the investigator visited personally all the twelve science conventional colleges with a well prepared questionnaire as a tool of research. She administered the questionnaire to the students studying B.Sc. physics course in the class. So also the investigator collected the responses from the teachers and principals of respective colleges.

In order to know the overall opinion of B.Sc. physics course the opinionnaire was administered to the Regional Director and management of all the twelve conventional colleges and collected the responses.

During the third phase, investigator personally visited all the three study centres during the counselling and observed the counselling session in the class by means of Observation Schedule. The main objective was to know the teacher behaviour during the teaching learning process. Similarly, the investigator personally visited all the twelve colleges during the teaching learning process and observed the teacher behaviour.

**Statistical Technique Used**

Following Statistical Techniques were used

1) Percentage Analysis

2) t-test