Chapter: 3

Research Design

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Chapter: 3  
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3.1 Introduction:

In research work research design is an important step of research process. As plan is very important for Engineer, for researcher, research design has much importance. By research design one can proceed further in order. It means that it is an active portion of research. If it has been thought out systematically and logically as well as scientifically, then, the entire research work proceeds further very easily. If the method adopted in research work is very proper and then it becomes more successful.

Walter B. Borg and M.R.Gall (1983) Says about this that:

“The factor that most often differentiate between good and poor research is not the fund available, the size of the sample or sophistication of the statistics, it is the care and thought that goes into the research plan.” ¹

Research work cannot be done in a moment. For that many processes are to be undertaken. On the side of research during this whale process, patience and accuracy are needed, planning without long-sightedness affects the whole process of research. So planning has an important place in the field of research. Form the very beginning of the research, the selection of it subject, Review of related literate, Method of research and by the framework of the entire work, the wastage of time, energy and finance stops and one gets the direction about the research. By planning one gets accuracy, abridgement, effectiveness, certainty etc. The planned study is more accurate and reliable. So in the present chapter, the research design is discussed in detail.
3.2 Population:

In any study until the population is not defined, the research work cannot proceed further.

While defining population I.W. West (1989) has noted that, “A population is any group of individuals that have one or more characteristics in common that are of interest to the researcher”.

According to K.S. Siddhu (1996) “By population we mean the aggregate or totality of objects on individuals regarding which inferences are to be made in a sampling study.”

Thus, population means a total of individuals, fields of research and matters by depending on which the assessment of determined results is thought off.

Population also means a group of things having common characteristics.

This definition mentions two things:

(1) Population is a group of things
(2) Each thing of population has some common characteristic.

Hence it is necessary to define the population from which the sample has been taken.

In the present research the researcher has included the secondary schools of Gujarat State for the construction and standardization of Mechanical Aptitude test, i.e. the students of Secondary Schools of each district of Gujarat State become the population of the present study.

3.3 Selection of Sample:

In any research work it is not impossible to study all the units of the population but it becomes difficult definitely, so the investigator
has tried to study the sample that represents the population for the saving of time and energy and out of it to give the findings. According to Bertrand and Joseph P. Cebula (1980)

“Sample is the group of individual randomly selected from the population.”

Selection of the sample should be done in such a way that it is objective and results obtained on sample can be applied to the population. The statistical method of selection of the sample is recognised as sampling. According to K.S.Siddhu (1996),

“Sampling is the process of selecting a sample from the population. For this purpose the population is divided into a number of parts called sampling Units.”

According to the opinion of E.J.Mason and W.J.Bramble (1970)

“Selection of clusten of elements to study form a population of clusters”

According to the opinion of F. M. Kerlinger (1996) sapling means,

“Sampling is taking any person of a population of universe as a representative on that population or universe.”

In the present research students of secondary schools of Gujarat State is the population. So for selection of sample the entire Gujarat State has been divided into 4 zones. Out of which from each zone, total 25 schools of urban and rural area have been selected randomly selection of one class of std-9 and std-10 of the selected schools has been done by cluster method. Thus, from the entire Gujarat stats a sample of 2000 students has been selected by stratified random sampling and cluster method, Which has been mentioned in Table 3.1
and the list of schools selected in sample has been presented in Appendix –A

Table 3.1
Sample for Final Testing

<table>
<thead>
<tr>
<th>Standard</th>
<th>9</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
</tr>
<tr>
<td>Urban Area</td>
<td>312</td>
<td>276</td>
<td>248</td>
</tr>
<tr>
<td>Ruler Area</td>
<td>266</td>
<td>244</td>
<td>227</td>
</tr>
<tr>
<td>Total</td>
<td>578</td>
<td>520</td>
<td>475</td>
</tr>
</tbody>
</table>

3.4 Tool of the Research:

In research tool is very important for data collection, if the proper tool is constructed and it has been property used, then on can get the valid data.

In the present research the investigator has constructed Mechanics Aptitude test for the students of std.9 and std.10. The detailed discussion about it has been given chapter 4 and accordingly by constructing the items the data has been collected.

This test is entirely independent type of Aptitude Test. It has been prepared by pre-pilot testing and item Analysis. The details of which is given in chapter- 4.

For assessing the validity of the test, verbal-non verbal Group Intelligence Test constructed by Dr. K.G. Desai and marks of Science of Students of std-9 and std-10 has been used.

3.5 Research Method:

Research method or technique is very important for orbiting useful, satisfactory and reliable result of any research, because by it research work becomes very easy and time as well as finance are saved and the result of research is logical.

There are many methods of research such as Experimental Method, Historical Method, Cause Comparative Method, Survey
Method etc. while selecting the research method, the form of the study selection of sample, objective to be achieved. Etc should be kept in mind.

In the present studies, the investigator has used Survey method. Survey Method gives the description and interpretation of the parlaying situation. It gives the description on the basis of the situation of certain process, thoughts, trend, effects, attitudes and expression. Thus, the method assessing the prevailing situation means survey method.

The main objective of this type of survey is to establish norms. In the present study the norms are to be established by getting the detail wise data from the great number of community, Normative Surveys method has been used.

3.6 Data collection:

For data collection proper planning along with the pre preparation is very necessary for this the investigator tool the permission of the principals through visits, by diving the Gujarat state in 4 zones and by thinking about the diversity of the level of the students and area of the 6 schools selected randomly out of each zone. According to the time given by them by going to various classes and by establishing rapport with the students, they were given the proper instructions and understanding about the test. Thus the answer sheets of Mechanical Aptitude test were filled up by the students and thus dot was collected from total 2000 students.

3.7 Data Analysis:

After checking the obtained answer sheets by testing, out of the obtained scores by each subject taken in sample in the study, the frequency distributions were prepared. Frequency distribution was
prepared of each field, std-wise and sex-wise out of the statements of each field.

On the basis of the obtained search statistical analysis was done. Out of the sex wise and std-wise frequency distributions, Mean, Median, Mode, S.D., S.D., S.E., Q.D., Skewness, Kurtosis, PR and r were calculated and norms were established.

For establishing reliability, Test retests Method, Split- half Method, Kuder-Richardson Method were used and for validity congruent and con-current methods were used.

3.8 Experiences of the Investigator:

For the present study the researcher got the opportunity for going to each district of Gujarat state because entire Gujarat state was the population so one got the experiences of getting information about the education arrangement of the entire Gujarat State.

During data collection the investigator had some common experiences due to the contact with the students. Moreover, the following are some special experiences.

- As it was some different type of work rather than the daily routing work the students enjoyed. So it was seen that the coming generation was ready for change.
- In some schools teacher and principals co-operated very well and they honoured the research work done in Guajarati language.
- Some teachers showed indifference towards the test by saying that in such type of research work the time is wasted. Yet with the co-operation of the principals the work was done.
- In some schools there was the lack of discipline and accuracy as the students’ course not understands the seriousness of the test.
- Students were very enthusiastic to know about the result, so they were asking about the time of the result of it.
- There was the difference in and practiced responding the test between the students of Urban area and rural area.
- Thus while doing the research the relations with students, teachers and principals of the schools become the lovely remembrance.
References