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Chapter 3

DESIGN OF THE STUDY

3.0 Introduction

The third step of any scientific research is to prepare a research design. A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to research purpose with economy in procedure. Infact, the research design is the conceptual structure within which research is conducted. It constitutes the blue print for the collection, measurement and analysis of the data.

Planning is a necessary step for a good research. Design is the heart of any research. The following aspects have been discussed in detail which are concerned with the design of the present study. Research procedures followed include method of research, the operational definitions of the different terms used, the various hypotheses, selection of the sample includes the sample techniques and the selection of suitable tool for collection of data, description of tool selected, testing its suitability in the present study, and the procedure followed in the administration of the tool to collect the data required for this study.

3.1 METHOD OF RESEARCH

Research methods are of utmost importance in a research process. They describe the various steps of the plan of attack to be adopted in solving a research problem. A pre-planned and well described method will provide the researcher a scientific and feasible plan for attacking and solving the problem under investigation.

For the present research "Job Satisfaction and professional Views of Faculty Members in the Universities of Andhra Pradesh" the normative survey method is used.

3.2 Statement of the Problem

"Job Satisfaction and Professional Views of faculty members in the Universities of Andhra Pradesh".

With the changing scenario of the society it is observed by the researcher that many are not having an ideal job satisfaction. Teacher is the most vital single factor of influence in the system of education. The teachers' place in the society is of vital importance and acts as a pivot for the transmission of intellectual tradition and technical skill from generation to generation and helps to keep the lamp of civilization burning.

Universities function as the focal centres of higher learning. University is essentially a community of teachers and students who come together with the goal of teaching learning and expanding the horizons of human knowledge. In short, universities aim at human resource development.

Keeping the above points in view the researcher made an attempt to study the job satisfaction and professional views of an oldest conventional university (Osmania University) and a completely distance education university (BRAOU) faculty members of Andhra Pradesh.

3.3 Survey Method

The word "survey" indicates the gathering of the data regarding current conditions.

George J. Mouly has said - "No category of educational research is more widely used as the survey, the normative survey, status and descriptive research. This broad classification comprises a variety of specific techniques and procedures, all similar from the stand - point of purpose that is, to establish the status of the phenomenon under investigation." ¹

Normative Survey Method

The descriptive or normative survey method of educational research is very common. It is that method of investigation which attempts to describe and interpret what exists at present in the form of conditions, practices, processes, trends, effects, attitudes, beliefs etc. It is concerned with the phenomenon that are typical of normal conditions. It investigates into the conditions or relationships and existing practices that prevail, beliefs, points of view or attitudes that are held, processes that are going on, influences that are being felt and trends that are developing. It is an organized attempt to analyze, interpret and report the present status of a social institution, group or area.

The compound adjective "Normative Survey" is applied to this method in order to suggest the two are closely related to the study. The word "Survey" indicates the gathering of the data regarding current conditions. The word "Normative" is used because surveys are frequently made for the purpose of ascertaining which is the normal or typical condition or practice.

Worth while survey studies collect three types of information.

1. Of what exists by studying and analyzing important aspects of present situation.
2. Of what we want by clarifying goals and objectives possible through a

study of the conditions existing else where or what experts other wise consider to be desirable.

3. Of what to get there through discovering the possible means of achieving the goals on the basis of the experience of others or the opinions of experts.²

Characteristics of Normative Survey Method

1. It determines the present trends and solves current practical problem .
2. It gathers data from a relatively large number of cases.
3. It is concerned not with the characteristics of individuals but with generalized statistics of the whole population or a representative sample.
4. It deals with clearly defined problems and has definite objectives. It requires an imaginative planning, a careful analysis and interpretation of the data and a logical and skilful reporting of the findings.

In view of the techniques employed, there are six types of surveys.

1. Survey Testing
2. Questionnaire Inquiries
3. Documentary frequency Studies
4. Interview Studies
5. Observational Studies
6. Appraisal Procedures

Appraisal is a form of classification or scaling according to subjective values.³ For the present study appraisal procedure rating scale was used.

3.4 OPERATIONAL DEFINITIONS OF KEY TERMS

Every research study involves certain key terms, which have some special connotation in the content of study. Hence, it is always desirable to classify such key terms in the study. The crucial and significant terms which are most frequently used in the study should not only be defined but also be classified in the content of the study.

The operational definition of the key term for this research work is :

Job Satisfaction

The term "Job satisfaction" denotes the extent to which the needs and expectations of an individual are satisfied, and the extent to which the individual perceives that satisfaction as stemming from his total situation.⁴

The key term job satisfaction refers to the work role of university teachers, regarding the areas of Teaching profession, Departmental work, Sense of purpose, Co-operation of colleagues and students, Salary, Personal satisfaction, Accommodation and Social activities, Administration, Facilities, Achievement, Aptitude and Attitude.

3.5 VARIABLES TAKEN FOR THE STUDY

Variables are the conditions or characteristics that the experimenter manipulates, controls or observes. The independent variables are the conditions or characteristics that the experimenter manipulates or controls in his or her attempt to ascertain their relationship to observed phenomena.

The dependent Variables are the conditions or characteristics that appear, disappear or change as the experimenter introduces, removes or changes independent variables.

Table 3.1 : showing Dependent and Independent Variables

S. No.	Dependent Variables	Independent Variables
1.	Job Satisfaction	Various faculties in the university (Arts & Science)
2.	of	Age
3.	University	Gender
4.	faculty members	Experience
5.		Income
6.		Conventional (Osmania) University and Open University.

3.6 OBJECTIVES OF THE STUDY

1. To find out the job satisfaction of teachers working in two different types of universities i.e., Osmania University (O.U.) conventional and Dr. B. R. Ambedkar Open University (Dr. BRAOU).
2. To find out the job satisfaction of teachers working in different faculties in the universities.
3. To find out the impact of gender on job satisfaction of university faculty members of Dr. BRAOU and O.U.
4. To find out the impact of age on job satisfaction of faculty members of Dr. BRAOU and O.U.

5. To find out the impact of teaching experience on job satisfaction of Dr. BRAOU and O.U. faculty members.
6. To find out the impact of salary variations on job satisfaction among the faculty members of Dr. BRAOU and O.U.
7. To find out the impact of job satisfaction of Arts and Science faculty members of Dr. BRAOU and O.U.

3.7 HYPOTHESIS

⁵ Once the selection and definition of the problem has been accomplished, the derivation of hypotheses is the most important step in the research process. Etymologically hypothesis is made up of two words, “hypo” (less than) and “thesis”, which means less than or less certain than a thesis. It is the presumptive statement of a proposition or a reasonable guess, based upon the available evidence, which the researcher seeks to prove through his study.

According to Hilcuay (1964) : The hypothesis is a powerful tool in research process to achieve dependable knowledge. It helps the researchers to relate theory to observation and observation to theory.

Hypothesis of the Study

A hypothesis is a tentative assumption drawn from knowledge and theory. It is used as a guide in the investigation of other facts and theories that are as yet unknown. Its formulation is one of the most difficult and most

crucial step in the entire scientific process. A poorly chosen or poorly worded hypothesis can prevent the following :

- (i) The obtaining of enough pertinent data.
- (ii) The drawing of conclusions and generalizations, and
- (iii) The application of certain statistical measures in the analysis of the result.

A study may be devoted to testing of one major hypothesis, a number of subsidiary hypothesis, or both major and subsidiary hypothesis. When several hypothesis are used, each should be stated separately in order to anticipate the type of analysis required and in order to definitely accept or reject each hypothesis on its own merit. Irrespective of the number or type used each hypothesis should be testable and based upon a logical foundation. Hildreth Hoke Mc Ashan grant is only one possible exception to the above statements, which is that when fact finding alone is the primary aim of the study, it may not always be necessary to formulate an explicit hypothesis.

The hypothesis can be stated in a number of forms which are :

1. Null form
2. Predictive form
3. Declarative form
4. Question form

For the present study hypothesis is presented in the predictive form.

Predictive Form

It is chosen because it allows the research worker to state principles which he actually expects to emerge from the study. ⁶

Hypotheses for the Present Study

Hypothesis 1

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in their job satisfaction.

Hypothesis 2

There may be impact of gender in job satisfaction of Dr. B.R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members

Hypothesis 2 (a)

There may be impact of gender in job satisfaction of Dr. B.R. Ambedkar Open University (Dr. BRAOU) faculty members.

Hypothesis 2 (b)

There may be impact of gender in job satisfaction of Osmania University (O.U.) faculty members.

Hypothesis 3

There may be difference of opinion between faculty members of forty and above forty years of age and below forty years of age of

Dr. B.R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) in job satisfaction.

Hypothesis 3 (a)

There may be difference of opinion between faculty members of forty and above forty years of age and below forty years of age of Dr. B. R. Ambedkar Open University (Dr. BRAOU) in job satisfaction.

Hypothesis 3 (b)

There may be difference of opinion between faculty members of forty and above forty years of age and below forty years of age of Osmania University (O.U.) in job satisfaction.

Hypothesis 4

There may be difference of opinion between faculty members with twenty and above twenty years of experience and below twenty years of experience of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) in job satisfaction.

Hypothesis 4 (a)

There may be difference of opinion between faculty members with twenty and above twenty years of experience and below twenty years of experience of Dr. B. R. Ambedkar Open University (Dr. BRAOU) in job satisfaction.

Hypothesis 4 (b)

There may be difference of opinion between faculty members with twenty and above twenty years of experience and below twenty years of experience of Osmania University (O.U.) in job satisfaction

Hypothesis 5

There may be difference of opinion between less salaried (less than Rs. 35,000 per month) and more salaried (Rs. 35,000 and more per month) faculty members of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) in job satisfaction.

Hypothesis 5 (a)

There may be difference of opinion between less salaried (less than Rs. 35,000 per month) and more salaried (Rs. 35,000 and more per month) faculty members of Dr. B. R. Ambedkar Open University (Dr. BRAOU) in job satisfaction.

Hypothesis 5 (b)

There may be difference of opinion between less salaried (less than Rs. 35,000 per month) and more salaried (Rs. 35,000 and more per month) faculty members of Osmania University (O.U.) in job satisfaction.

Hypothesis 6

There may be difference of opinion between arts and science faculty members of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) in job satisfaction.

Hypothesis 6 (a)

There may be difference of opinion between arts and science faculty members of Dr. B. R. Ambedkar Open University (Dr. BRAOU) in job satisfaction.

Hypothesis 6 (b)

There may be difference of opinion between arts and science faculty members of Osmania University (O.U.) in job satisfaction.

Hypothesis 7 (a)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of teaching profession.

Hypothesis 7 (b)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of departmental work in their level of job satisfaction.

Hypothesis 7 (c)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of sense of purpose.

Hypothesis 7 (d)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of co-operation of colleagues and students.

Hypothesis 7 (e)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of salary, personal satisfaction, accommodation and social activities in their level of job satisfaction.

Hypothesis 7 (f)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of administration.

Hypothesis 7 (g)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of facilities.

Hypothesis 7 (h)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of achievement.

Hypothesis 7 (i)

There may be difference of opinion of Dr. B. R. Ambedkar Open University (Dr. BRAOU) and Osmania University (O.U.) faculty members in the area of aptitude and attitudes.

3.8 Scope of the Study

Job satisfaction is a primary requisite for any successful teaching - learning process. Job satisfaction is a complex phenomenon involving various personal, institutional and social aspects. If the teachers attain adequate job satisfaction they will be in a position to fulfil the educational objectives and national goals. Identifying the importance of job satisfaction in the life and career of a teacher, this study has been taken up to identify the job satisfaction of university teachers working in Osmania University (conventional) and also Dr. B. R. Ambedkar Open University, Hyderabad from various departments of Science, Arts, Social Sciences, Commerce & Business Management, Education, Research Centre and Students Service branch from Dr. B.R. Ambedkar Open university. Arts, Science, Social Sciences, Commerce & Business Management, Education and Law department faculty members from Osmania University, Hyderabad were chosen for study.

3.9 Population

By population, we mean the aggregate totality of individuals regarding which inferences are to be made in a sampling study.

A population is any group of individuals that have one or more characteristics in common that are of interest to the researcher. The population is properly defined so that there is no ambiguity as to whether a given unit belongs to the population. If a population is not properly defined, a researcher does not know what units to consider when selecting the sample.⁷

The entire population here refers to the teachers working in the following faculties which are Science, Arts, Social Sciences, Commerce and Business Management and Education in Osmania University and Dr. B.R. Ambedkar Open University.

3.10 Sample

A sample is a small proportion of a population selected for observation and analysis. It is a collection consisting of a part or subset of the objectives or individuals or population, which is selected for the purpose of representing the sample, one can make certain inferences about the characteristics of population from which it is drawn.

The sample for the present study is one hundred faculty members from different departments of Osmania (conventional) University and fifty faculty members from different departments of Dr. B.R. Ambedkar Open University, Hyderabad.

3.11 METHOD OF SAMPLING

After sampling for the present study, consideration was given to whether the entire population is to be made the subject or a particular group is to be selected as representative of the whole population. There are different types of sampling methods.

For the present research "Job satisfaction and professional views of faculty members in the Universities of Andhra Pradesh", the researcher has used Stratified Random Sampling method.

Stratified Random Sampling

The population is divided into smaller homogeneous groups or strata by some characteristics and from each of them, small homogeneous groups are drawn at random, a predetermined number of units.

This technique requires one to select units at random from each stratum in proportion to its actual size in the total population. First of all different variables involved in the study of the problem may be noted. The data should be clear-cut and free from overlapping.

The staff from different departments of Osmania (Conventional) University and Dr. B.R. Ambedkar Open University are the strata and from each stratum the sample is selected at random.

3.12 SELECTION OF THE TOOL

⁸ Reliability and validity are essential for the effectiveness of any data gathering procedure. These terms are defined here in the most general way. Reliability is the degree of consistency that the instrument or procedure demonstrates : Whatever it is measuring, it does consistently. Validity is that quality of a data gathering instrument or procedure that enables it to measure what it is supposed to measure. Reliability is a necessary but not sufficient condition for validity. That is, a test must be reliable for it to be valid, but a test must be reliable and still not be valid. In the present study the researcher used five point rating scale as a tool.

A standardised tool - "Job Satisfaction Scale" prepared by Dr. Pramod Kumar and Prof. D. M. Mutha, was taken and some modifications were done by adding extra items related to all areas in teacher - job satisfaction.

Rating Scale

It is probably the most commonly used instrument for making appraisals. Ratings can be obtained through one of the three major approaches : 1) Paired Comparison; 2) Ranking and 3) Rating Scales.

According to Goode and Hatt, the design of rating technique must always take into account the existence of three elements; the judges who will do the rating, the phenomena to be rated, and the continuum along which they will be rated.

Rating scales have been put to extensive use in the field of rating teaching and teachers. This process extends to the selection of teachers and the prediction of teaching success. Closely related to the field of teacher rating is the general area of personality and character rating. These fields constitute the chief application of rating scales and instruments of many varieties that have been constructed. There are scales with various degrees of refinement in the description of traits and of different levels of each trait.

Types of Rating Scales

1. Descriptive Rating
2. Numerical Scale
3. The Graphic Scale
4. The Percentage of Group Scale

5. Man to Man Scale

In the present study the researcher used "The Graphic Scale".

Graphic Scale

The rater puts a check or tick mark (✓) before the characteristic or trait which is described in a phrase. In order to judge the pupil's initiative, for example, the rater may be asked to tick mark the most befitting description out of the following. It is also called "Behavioural Statement Scale".⁹

A five - point rating is given, against each statement are extremely positive, and extremely negative categories on either side of the scale and neutral category in the centre.

Strongly Agree (SA)

Agree (A)

Undecided (UD)

Disagree (DA)

Strongly Disagree (SD)

3.13 DESCRIPTION OF THE TOOL

For the present study, the items were framed taking nine areas, which are related to the job satisfaction of university teachers of different faculties working in Osmania (Conventional) University and Dr. B.R. Ambedkar Open University, Hyderabad.

The hundred items are in the form of statements. The statements are followed by a rating scale with points : Strongly Agree (SA), Agree (A),

Undecided (UD), Disagree (DA), Strongly Disagree (SDA). If the subject agrees with the statement he/she has to tick (✓) the point on the scale which suits his/her experiences in the profession. The subject has to respond to all the statements given. There is no time limit but the subject has to complete it at the earliest. The list of statements are separated into nine areas. They are teaching profession, departmental work, sense of purpose, co-operation of colleagues and students, salary, personal satisfaction, accommodation and social activities, administration, facilities, achievement, aptitude and attitude.

The tool used for the present study is a five point rating scale. It consists of hundred items. These items are from nine areas, which are related to the job satisfaction of two university faculty members which are Osmania (Conventional) University and Dr. B.R. Ambedkar Open University.

The number of items given under each area are :

- | | | |
|---|---|----------|
| 1. Teaching Profession | : | 15 items |
| 2. Departmental Work | : | 15 items |
| 3. Sense of Purpose | : | 05 items |
| 4. Co-operation of Colleagues and Students | : | 15 items |
| 5. Salary, Personal Satisfaction, Accommodation and Social Activities | : | 19 items |
| 6. Administration | : | 10 items |
| 7. Facilities | : | 07 items |
| 8. Achievement | : | 08 items |
| 9. Aptitude / Attitude | : | 06 items |

3.14 ADMINISTRATION OF THE TOOL

The five-point rating scale prepared was distributed to hundred teachers working in six different faculties which are Science, Arts, Social Sciences, Commerce and Business Management, Education and Law in Osmania University. The five-point rating scale was also distributed to fifty teachers working in six different faculties which are Science, Arts, Social Sciences, Commerce and Business Management, Education, Research Centre and Student Services Branch in Dr. B.R. Ambedkar Open University.

The five-point rating scale was distributed to a total of hundred and fifty teachers from both the universities.

The number of teachers selected from various departments are shown in the table.

Table 3.2 : List of the Departments of Osmania University from which the Samples were drawn

1.

	Name of the Department	No.of Teachers
Science	Zoology	3
	Physics	8
	Mathematics	5
	Geography	3
	Chemistry	7
	Technology	1
	Botany	2
	Astronomy	1
	Total	30

2.

	Name of the Department	No.of Teachers
Arts	English	5
	Urdu	2
	Telugu	3
	Hindi	2
	Ancient Indian History, Culture and Archeology	1
	Sanskrit	2
	Philosophy	5
	Total	20

3.

	Name of the Department	No.of Teachers
Social Sciences	Sociology	4
	Economics	6
	Political Science	3
	History	4
	Library Science	2
	Public Administration	1
	Total	20

4.

	Name of the Department	No.of Teachers
Commerce & Business Management	Commerce	8
	Business Management	7
	Total	15

5.

	Name of the Department	No.of Teachers
Education	Education	5
	Total	5

6.

	Name of the Department	No.of Teachers
Law	Law	10
	Total	10

Total of hundred teachers from different departments of Osmania
(Conventional) University were taken.

Table 3.3 : List of the Departments of Dr. B.R. Ambedkar Open University from which the Samples were drawn

1.

	Name of the Department	No.of Teachers
Science	Zoology	1
	Botany	2
	Geology	2
	Chemistry	2
	Mathematics	2
	Physics	2
	Total	11

2.

	Name of the Department	No.of Teachers
Arts	English	1
	Urdu	1
	Hindi	1
	Telugu	2
	Total	5

3.

	Name of the Department	No.of Teachers
Social Sciences	Public Relations	1
	Economics	1
	Library Science	2
	Sociology	2
	History	2
	Political Science	1
	Public Administration	3
	Economics	1
	Total	13

4.

	Name of the Department	No.of Teachers
Commerce & Business Management	Commerce	5
	Business Management	3
	Total	8

5.

	Name of the Department	No.of Teachers
Education	Education	2
	Total	2

6.

	Name of the Department	No.of Teachers
Research Centre & Student Services Branch	Research Centre	5
	Student Services Branch	6
	Total	11

Total of fifty teachers from different departments of Dr. B.R. Ambedkar Open University were taken.

The researcher has taken hundred teachers from Science, Arts, Social Sciences, Commerce and Business Management, Education and Law from the Departments of Osmania (Conventional) University. From Science faculty total of thirty samples were taken from the departments of Zoology, Physics, Mathematics, Geography, Chemistry, Technology, Botany and Astronomy.

In Arts faculty also the researcher has taken twenty samples which are from the departments of English, Urdu, Telugu, Hindi, Ancient Indian History - Culture and Archaeology, Sanskrit and Philosophy.

In Social Sciences the researcher has taken twenty samples which are from the departments of Sociology, Economics, Political Science, History, Library Science and Public Administration Departments.

From Commerce and Business Management faculty the researcher has taken fifteen samples which are eight from Commerce and seven from Business Management.

From Education faculty the researcher has taken five samples, and in law faculty the researcher has taken ten samples.

The researcher has taken fifty teachers from Science, Arts, Social Sciences, Commerce and Business Management, Education, Research Centre and Student Services Branch. From Science faculty the researcher has taken eleven samples which are from the departments of Zoology, Botany, Geology, Chemistry, Mathematics and Physics.

From Arts faculty the researcher has taken five samples which are from the departments of English, Urdu, Hindi and Telugu.

From Social Sciences the researcher has taken thirteen samples which are from the departments of Public Relations, Economics, Library Science, Sociology, History, Political Science, Public Administration and Economics.

From Commerce and Business Management the researcher has taken eight samples which are five from Commerce and three from Business Management department.

In Education Department the researcher has taken two samples.

In Research Centre and Student Services Branch the researcher has taken eleven samples which are five from research centre and six from student services Branch Departments.

The Osmania University (O.U) Science faculty members were treated as the science sample and the faculty members belonging to Arts, Social

Sciences, Commerce and Business Management, Education and Law were treated as Arts sample.

The Dr. B.R. Ambedkar Open University (Dr. BRAOU) Science faculty members were treated as the science sample and Arts, Social Sciences, Commerce and Business Management, Education and Research Centre and Students Services branch were treated as Arts sample.

The data was also collected through secondary sources such as Annual Reports and Calenders of the Universities etc., and through in-depth discussions with faculty members to supplement the primary data. All the filled rating scales have been scrutinised so as to appraise the qualitative and quantitative aspects of the data before each questionnaire was passed for tabulation.

3.15 Scoring

Each item has five responses, they are Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (DA), Strongly Disagree (SDA). The following score is allotted for the responses.

Response	Score
Strongly Agree	5
Agree	4
Undecided	3
Disagree	2
Strongly Disagree	1

The statement wise (marks) analysis has been taken for all the faculty members.

3.16 Data Analysis

The data collected was analysed using various statistical measures like Arithmetic mean, Standard deviation, 't'-test and simple measures like percentages. Wherever necessary and according to the demand of the study descriptive analysis is also made.

In the present study the researcher has used the following techniques to analyse the data.

1. Arithmetic Mean (A.M)
2. Standard Deviation (S.D)
3. Critical Ratio (C.R)

1. Arithmetic Mean (AM)

This is the simplest but most useful means of central tendency. It is nothing but the average. The following formula was used to calculate: mean

$$\text{Mean (M)} = \frac{\Sigma x}{N}$$

Where,

Σx stands for the sum of scores (Σ = Sum, x = Individual scores)

N stands for total sample.

2. Standard Deviation (SD)

Standard deviation of a set of scores is defined as the square root of the average of the squares of the deviations of each score from the mean.

The formula used to analyse the data is

$$SD = \sqrt{\frac{\Sigma(x - M)^2}{N}} = \sqrt{\frac{\Sigma x^2}{N}}$$

Where

X = Individual scores

M = Mean of the given scores

N = Total sample

x = Deviation of each score from the mean.

In the present study the researcher has computed the standard deviation of whole sample.¹⁰

3. Critical Ratio (C.R)

This static is used to determine whether the difference between population means is significant or not. The formula used for the calculation is :

$$C. R. = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

σ_1^2, σ_2^2 = the standard deviation of first and second samples.

M_1, M_2 = Mean of the two samples.

N_1, N_2 = Size of the two samples.¹¹

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