

Classification and Tabulation

Introduction

Data can be collected from a source by using different methods. Usually the collected data will be in questionnaires, schedules or response sheets. It is the duty of a statistician to consolidate the data. This process is known as Classification and Tabulation. We can include a huge volume of data in a simple statistical table and one can easily get an overview about the sample by observing the statistical table rather than the raw data. Tables will help one to construct diagrams and graphs. Tables are highly useful for further statistical analysis and interpretation. In this chapter we discuss the different methods of classification and tabulation of data with its features.

Learning Outcomes

After the transaction of this chapter, the learner:

- 3.1. identifies the need for Classification and Tabulation.
- 3.2. recognises the different methods of Classification and Tabulation.
- 3.3. classifies raw data into useful information.
- 3.4. constructs frequency tables.
- 3.5. interprets the data.

Concepts/Ideas/ Process Skills	Process/Activity with assessment	Learning outcome
<ul style="list-style-type: none"> • Concept of Classification and Tabulation - Observing - Classifying - Communicating 	Discussion on need of classification and Tabulation	<ul style="list-style-type: none"> • Identifies the need of Classification and Tabulation
<p>Methods of Classification</p> <ul style="list-style-type: none"> • Geographical Classification • Chronological Classification • Qualitative Classification • Quantitative Classification - Observing - Measuring and Charting - Classifying - Communicating - Interpreting data 	Presenting seminar by collecting different types of classified data from magazines, newspapers and websites.	<ul style="list-style-type: none"> • Recognises the different methods of Classification.
<p>Classification of Data by different methods</p> <ul style="list-style-type: none"> • Geographical Classification • Chronological Classification • Qualitative Classification • Quantitative Classification - Classifying - Observing - Interpreting Data - Measuring and charting - Communicating 	Preparing the frame of tables by classifying according to the nature of the problem situation provided by the teacher.	<ul style="list-style-type: none"> • Classifies raw data to useful information

Concepts/Ideas/ Process Skills	Process/Activity with assessment	Learning outcome
<p>Frequency Tables</p> <ul style="list-style-type: none"> • Discrete • Continuous • Inclusive and Exclusive • Cumulative (Less than and Greater than) • Relative • Percentage - Observing - Communicating - Classifying - Using number relation - Formulating statistical Tables 	<p>Gathering data from different sources and tabulating them for further analysis.</p>	<p>Construct frequency tables.</p>
<ul style="list-style-type: none"> • Interpretation of statistical tables <ul style="list-style-type: none"> • Simple • Two way • Mani fold - Communicating - Observing - Interpretation of data - Inferring - Predicting 	<p>Collecting available statistical tables from journals and internet and interprets the data.</p>	<p>Interprets the data.</p>

Values and attitudes

The learner:

- develops an attitude of systematic planning and organisation.
- realises the diversity of society.
- develops empathy towards the marginalised people.
- realises hikes in market prices.
- realises impacts of consumerism.
- develops a desire to explore new horizons of knowledge.
- develops readiness to modify conclusions in the light of new evidences.
- develops intellectual honesty.

Through the Chapter...

3.1 Concept: Need of Classification and Tabulation

Suggested activity: DISCUSSION

Teacher asks some questions to the students as shown below.

How many of you belong to the Panchayath A? (Municipality Ward or Corporation Ward)

How many of you belong to the Panchayath B?

Usually some of the students will raise their hands in response to the questions. Teacher insists the students to chart out the number of students belonging to each category and teacher writes the number on the black board. Separate details of boys and girls may be collected.

Then teacher asks some other questions regarding the second language, year of birth, number of family members, number of A+ in SSLC etc. Students chart out the number in each case and teacher writes the details on the black board. Teacher tells the students to give maximum number of inferences that can be made from the tables. Teacher supports the students by giving some inferences like, the majority of the students are from Panchayath B, only 6 students have scored 10 A+ in the SSLC, majority of the boys choose Malayalam as second language etc.

Students realises that we can classify and tabulate the students into different groups according to the attributes and such classifications will help us for comparisons and analysis. Without classifying the data into different classes according to the characteristics of the data one cannot go further with it. If the data is once classified and consolidated in a table even a layman can arrive at conclusions regarding the data.

Teacher concludes the activity by emphasising the need for classification and tabulation. Also introduces the concept of Quantitative Classification (Number of A+), Qualitative Classification (Second Language, since second language is selected according to the quality 'like' or 'dislike'), Chronological Classification (year of birth) and Geographical Classification (Panchayath) through the discussion of the above data.

To assess the students, following indicators may be used

- Communication skill
- Observation skill
- Charting skill

3.2 Concept: Classification - Various Types

Suggested activity: SEMINAR

Divide the entire students into 4 or 5 groups. Each group collects the maximum number of different types of tables from the newspapers, magazines, journals and internet. They present a seminar on the different types of classifications and its characteristics with the help of slide presentation.

The tasks involved are

- Collection of tables from newspapers, magazines, journals or internet.
- Classification of the collected tables (Qualitative, Quantitative, etc.)
- Why this type of classification is used in the table?
- Identifies the peculiarities of this table.
- Presentation.
- Report writing (for portfolio assessment).
- Seminar note writing (Activity Log).

Students compare the classifications made in the previous activity in this scenario. They realise that the classification done according to the year of birth is chronological classification, number of A+ in SSLC is Quantitative Classification, second language is Qualitative Classification, and which pachayath they belong to is Geographical Classification

Teacher consolidates the seminar with the help of slide presentation.

Different types of classifications are

- Qualitative classification
- Quantitative classification

- Chronological classification
- Geographical classification

To assess the students, following indicators may be used.

- Communication skill
- Observation skill
- Classifying and discriminating skill

3.3 Concept: Classification of Data

Suggested activity: GROUP WORK

Divide the students into 3 or 4 groups. Teacher provides different problem situations to classify and tabulate data according to attributes. Examples are given below.

- 1) In a college boys and girls are studying in BA, B.Sc and B.Com courses in the first year, second year and final year. Prepare the frame of the table.
- 2) In a company men and women are working in different categories of job. The seniority of the employees varies from 1 year to 30 years. Prepare the frame.

At least two cases should be given to each group. Teacher may illustrate a problem to encourage the students. Each group prepares the frame of the table according to the nature of the situation and presents before the other groups. Teacher leads the discussion on various types of classification especially one way and two way classifications and consolidates the discussion. The consolidation points are

- Qualitative classification
- Quantitative classification
- Chronological classification
- Geographical classification
- One way classification
- Two way classification

To assess the students, the following indicators may be used:

- Communication skill
- Observation skill
- Classifying and discriminating skill

3.4 Concept: Construction of Frequency Tables

Suggested activity: GROUP WORK

Teacher provides the marks obtained by the students in the last unit evaluation and demonstrates the method of tabulation by giving tally marks as shown in the textbook. Teacher asks some questions that they are able to answer by observing the table. Then ask some questions which they are not able to answer directly from the table and lead the students to the need of different types of frequency tables, Relative, Percentage, Cumulative etc. Provide the opportunity to the students to prepare such of statistical tables with the help of the teacher. Students shall refer to the textbook and observe the procedure involved in tabulation. They explain the uses and advantages of these types of tabulation.

The consolidation points are

- Discrete Frequency Tables
- Continuous Frequency Tables
- Relative Frequency Tables
- Percentage Frequency Tables
- Cumulative Frequency Tables
- Bivariate Frequency Tables

To assess the students, following indicators may be used.

- Observation skill
- Classifying and discriminating skill
- Logical reasoning
- Numerical intelligence
- Analytical Reasoning

3.5 Concept: Interpretation of Data

Suggested activity: GROUP WORK

Teacher divides the students into four or five groups and provides some statistical tables published in journals to each group. Each group prepares some questions regarding the data contained in the table with the help of the teacher. (Some sample questions may be provided by the teacher). They present the table supplied to them with the help of a multimedia projector and ask the prepared questions to other groups. Students in the remaining groups interpret the table and provide the answers with the help of the teacher. A sample is shown below.

The table given below shows some details regarding the population, literates and illiterates (in thousands) and percentage of literacy in three states, in a year. Students fill the missed cells of the table. Teacher asks 'what are the interpretations that can be made from the table?'. Students answer the following questions also.

State	Population	Literates	Illeterates	Percentage of literacy
Tamilnadu	52000	20800		
Maharashtra		40300	24700	
W. bengal	56000			36

- Percentage of literacy in Tamilnadu is
a) 60 b) 33. c) 40 d) 20
- Percentage of literacy in Maharashtra is
a) 65 b) 62 c) 38 d) 35
- Number of illiterates in Bengal (in thousands) is
a) 20160 b) 28840 c) 36160 d) 35840

The process continues by taking the leadership by other groups also. Teacher consolidates the session by explaining the need and importance of data interpretation.

To assess the students, following indicators may be used

- Observation skill
- Analytic skill
- Data interpretation skill
- Numerical intelligence
- Decision making skill
- Logical reasoning

CE Activities

Collect the data from any easily available source. Following are some possible activities.

- Percentage results of SSLC in the last 6 years from the school.
- Number of stream wise admission of boys and girls in the last five years from the school.
- Number of students studying in science, humanities and commerce from three or four nearby schools.
- The expenditure of various food items at home for a month.

5. The marks of students of the class in a particular subject.
6. The height and weight of students in the class.
7. The height and weight of teachers of the school.
8. The electricity bill of the last three years from the house.

Prepare

- a. Frequency table
- b. Relative frequency table
- c. Percentage frequency table
- d. Less than cumulative frequency table
- e. Greater than cumulative frequency table
- f. Bivariate frequency table
- g. Marginal frequency table

PE Activity

Lab Work:

Prepare a frequency table for the data collected in CE activity using spreadsheet and R.

TE Items

Try to discuss the TE questions given in the Textbook. After discussion each student may do the problems as individual work. If needed the following problems can also be used.

- 1) The number broken biscuits contained per packet is observed as below. Tabulate the data.

1	0	0	2	3	2	0	1	1	1	2	0
5	0	1	3	2	2	0	1	2	0	2	3
4	1	0	2	2	3	2	1	0	0	2	0
3	2	0	1								

- 2) 60 rubber bands are stretched and inspected. The expansions in centimetres are obtained as shown below. Prepare a frequency table.

3.30	4.56	4.10	3.78	5.51	6.00	7.10	5.70	4.84	4.78
3.80	3.90	5.40	4.90	6.43	4.22	3.90	3.14	4.50	5.13
3.33	4.36	4.60	5.51	5.20	6.40	4.12	5.36	3.57	4.60
4.23	3.37	4.25	4.67	3.88	4.20	5.30	5.10	3.40	3.24
6.21	3.90	4.34	4.98	5.28	4.53	4.90	5.00	4.96	3.98
4.67	4.75	5.60	5.51	5.20	6.43	4.42	3.76	4.56	4.40

3) Complete the following frequency table

Marks in Mathematics	Marks in General Knowledge				Total
	10-20	20-30	30-40	40-50	
10-20		4	2	0	11
20-30		9	6	1	
30-40	3	8		13	
40-50	0		9	15	26
Total	14		34		

4) The total electricity generation in a country is 184GW. The contribution of different energy sources are indicated below.

Source	Percentage of contribution
Fossil Fuels	70
Hydro Power	20
Wind and Solar Energy	7
Nuclear Power	3
Total	100

- What is the contribution of Hydro Power in absolute terms in electricity generation?
- What is the contribution of renewable energy sources in absolute terms in electricity generation?