The Systematic research for answers to certain question, often using empirical evidence but also using logical argument and reflection on social understanding. It is also a systematic investigation to establish fact or principles or to collect information on a subject. Methodology implies more than simply the methods you intend to use to collect data. It is often necessary to include a consideration of the concepts and theories which underlie the methods.

Knowledge of research methodology is essential for all those who either play an active role in conducting research or desire to keep themselves abreast of the contemporary developments in the field of knowledge

The present study is an attempt to find out data literacy among postgraduate students in Calicut district. The methodology adopted for the study described under the following headings.

* Variable of the study
* Objectives
* Hypothesis
* Tools used for the study
* Sample used for the study
* Data collection procedure
* Scoring and consolidation of data
* Statistical technique used for the analysis of data

**Variable of the study**

 A variable is defined as anything that has a quantity or quality that varies. The dependent variable is the variable a researcher is interested in. An independent variable is a variable believed to affect the dependent variable.

The present study concerned with single variable ‘Data literacy’, besides, the following student variable is treated as classificatory variable

* Gender
* Locale of the college
* Type of management of the college
* Subject of specialization

**Objectives**

* To know extent of data literacy of post graduate students
* To test whether there exist any significant difference in the level of students in post graduate level regarding the data literacy in the following sub samples
* Gender
* Locale of the college
* Type of management of the college
* Subject of specialization

**Hypothesis**

* There will be significant difference in the level of data literacy among post graduate students on the basis of
* Gender
* Locale of the college
* Type of management of the college
* Subject of specialization

**Tool Used for the Study**

 Tool is the instrument developed or adopted by the investigator to collect data. The tool must collect relevant and appropriate data in order to achieve the stated objective; the investigator has developed the following tool

**Data Literacy Test**

 Data literacy test is a test used to find out the literacy level of post graduate students about data. The procedure of construction of data literacy test described under the following head lines

1. Planning of the test
2. Preparation of the test

**Planning of The Test**

For the preparation of the test the investigator made an extensive study on the features of data literacy and its components. On the light of these idea and discussion with teachers the investigator prepares the test.

For the purposes of the study, the terms describing key components of effective data use are

**Continuously:** using data as part of daily routines and on an ongoing basis, rather than as a one-time event

Access: know the multiple types of data available (including but not limited to assessment data), understand which data are appropriate to address the question at hand, and know how to get the data (through electronic or other sources)

Interpret: take data and analyze and/or synthesize them to turn them into information appropriate for addressing the given problem or question

Act: take relevant information and apply it to generate further questions and/or apply it to decision-making appropriate to the given question

Communicate: share data points and the informa­tion synthesized from relevant data with stakeholders including parents, students, peers, principals, and others as applicable, to generate further questions, inform decision-making, or provide a better understanding of learning

 Relating to the each component of data literacy, the investigator prepared 10 items for each component

**Preparation of the test**

 The test items were prepared in accordance with five component of data literacy. After preparing the test items, the investigator avoided ambiguous and vague items and added some new items

The item has pooled five areas.

1. Continuously
* Example: 4, 9, 13, 18, 22…….
1. 27
2. 20
3. 23
4. 25
5. Communicate

Example;

* EGI: JLO

 PRT; ……?

1. AYW
2. WAY
3. VXA
4. VXZ
5. Interpret

Example:

By analyzing the graph write the following question



* What is the revenue of company A in 2007
1. 138
2. 120
3. 110
4. 150
5. Access

Example;

* Write the wrong number in the series

7, 28, 63,124,215,342….

1. 124
2. 215
3. 342
4. None of these
5. Access

Arrange logically

1) Key 2) Door 3) Lock 4) Room 5) switch on

1. 5,1,2,4,3
2. 4,2,1,5,3
3. 1,2,3,5,4
4. 1,3,2,4,5
5. Act

Example;

* Write the wrong number in the series

7, 28, 63,124,215,342….

1. 124
2. 215
3. 342
4. None of these

**Sample used For The Study**

 Sampling is the process of selecting units from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen.

For the present study the investigator selected sample from the post graduate students in Calicut district. The sample constitutes 600 post graduate students from 18 colleges including subject’s science, arts, commerce and language

In selecting the sample the investigator had to consider three major aspects

**Techniques of sampling**

 The population consists of large number of post graduate students belonging to different strata like gender, locale of the college, type of management, subject of specialization. The investigator had to adopt stratified sampling method to select samples, which will be representative of the population. To draw the sample, the investigator considered different strata of the population

**Gender of the student**

 Gender has great influence on finding s of a research. In many studies it has been found that gender differs in many of the variables. So investigator gave due representation to both the males and females in the present study

**Locale of the college**

 In our state more colleges are situated in urban area than rural area. In investigator selected urban rural in the ratio 2:1

**Type of management of the college**

 The students who get admitted to different type of institution are different, owing different criteria followed in those institutions. Hence the investigator included in the student from three type of institution for the study

**Subject of specialization**

 Subject of specialization also have significant difference.there for investigator selected sample from science, arts, commerce, and language students

**Data Collection Procedure**

**Administration of the tool**

 Collection of data involves the collection of relevant data to the problem under study. For the present study, after selecting the arts and science colleges in Calicut District from where the sample is drawn, the investigator contacted the principals for administering the test.

The investigator studied the basic literature relating to the selected data literacy tests, contained in the test manuals and other references and acquainted himself with the testing procedures etc., before commencing actual testing.

In administering the test, a uniform procedure was adopted in all the colleges. The investigator got help of the supervising teacher in administering the tests.

The investigator gave a brief explanation of the objective and scope of the study to the students and appealed to their conscious involvement and co-operation. The tasks to be done in answering each test were explained before each answer sheet was given. The samples were instructed as follow

This test consists of series of 50 items. Each questions has four choices .chose correct answer from these four choices” The following steps were invariably followed for conducting the test

* Distribution of the data literacy test to the samples
* Clearing the doubts of the samples, giving instructions regarding time limit, method of dealing with eventualities, and filling up the personal information blank etc.,
* Explaining the general directions in filling up the four response categories
* Making the students familiar with the four response categories, and method of entering the responses.
* Collecting back the answered response sheets.

**Scoring and Consolidation of Data**

The response sheets were scored according to the scoring key prepared for the purpose. The test on data literacy contains question from five dimensions. Each question carries 1 mark and 0 mark for wrong answer

|  |  |
| --- | --- |
| Numb of items in the test | Scores for The Responses |
| CorrectAnswer | Wrong answer |
| 50 | 1 | 1 |

**Reliability**

Reliability of the test refers to the degree of consistency with which it measures what it is indented to measure.”Reliability is the degree of consistency that the instrument or procedures demonstrate; whatever it is measuring, it does so consistently”. The investigator used Cronbachs alpha which is a statistical technique used to determining the internal consistency of the items. The value of Cronbachs alpha is .745 Hence the item included in the tool are correlated well and scale is reliable

**Validity `**

The validity of a measurement tool (for example, a test in education) is considered to be the degree to which the tool measures what it claims to measure; in this case, the validity is an equivalent to accuracy.

Validityis the extent to which an instrument measures what it is supposed to measure and performs as it is designed to perform. It is rare, if nearly impossible, that an instrument be 100% valid, so validity is generally measured in degrees. As a process, validation involves collecting and analyzing data to assess the accuracy of an instrument.

According to Best and Khan (2012) validity is that” quality of a data gathering instrument or procedure that enables to measure what is supposed to measure.”The validity of the present test is done through face validity*.* A test is said to have face validity when it appears to measure whatever the author had in mind namely what he thought he was measuring (Garret2012)*.* To ensure the face validity the investigator consulted experts in the area during the development of the tool and the tool was given to the experts for approval of items for testing data literacy among post graduate students*.* Thus ensured the face validity*.*

**Statistical Technique**

Preliminary analysis was done in order to arrive at conclusions about the nature of distribution. Preliminary analysis involves the following statistical techniques.

* Measure of central tendency
* Standard deviation
* Skewness
* Kurtosis

**Test of significance of difference between means for different categories**.

The statistical techniques “Test of significance of difference between mean for different categories” was used to find out if there exists any significant difference in concrete operational ability among elementary school students in the relevant subsamples.

The test of significance of difference between means for different categories is known as ’t’ test.

**t =**$\frac{X\_{1-}X\_{2}}{\sqrt{\frac{σ\_{1}^{2}}{N\_{1}}+\frac{σ\_{2}^{2}}{N\_{2}}}}$(Garatte 2005)

Where

X 1 = Mean of the group Ⅰ

X2 = Mean of the group Ⅱ

σ1 = Standard deviation of group Ⅰ

σ2 = Standard deviation of group Ⅱ

N1 = Sample size of group Ⅰ

N2 = sample size of group Ⅱ

If the obtained critical ratio is greater than the required value for significance .The mean difference is considered to be significant.

**one Way ANOVA**

ANOVA or Analysis of variance is used to compare the means of more than two populations. ANOVA uses the F- statistics, which test if the groups, formed by independent variable or a combination of independent variables, are significantly different. The larger the calculated F-ratio the greater in difference between groups is compared to within group difference. An F-ratio equal or less than the table value indicates that there is no significant difference between two groups.

In the present study one way ANOVA is used to find out whether there exist any significant mean differences data literacy among post graduate students in Calicut based on their type of management of college and subject of specialization. Type of management is categorized into three groups government, aided and unaided. Subject is categorized into three science, arts commerce and language. Hence for the present study the investigator used one way ANOVA.

1. Percentile

 A test score in and of itself is usually difficult to interpret. For example, if you learned that your score on a measure of shyness was 35 out of a possible 50, you would have little idea how shy you are compared to other people. More relevant is the percentage of people with lower shyness scores than yours. This percentage is called percentile If 65% of the scores were below yours, then your score would be the 65th percentile.