CHAPTER NO. : 2
## REVIEW OF RELATED LITERATURE

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2.1 INTRODUCTION :

A human can be develop and progress with the experience of the past. Published and collective knowledge in books may be the source of motivation for a person. So, it is necessary for the researcher to pass through the intensive study or related literature to make his research accurate and scientific. He has to refer periodicals, books, dictionaries, encyclopedias, abstracts of past researches, websites, dissertations, and these in the related area. This enable him/her to be familiar with up to date treatment of Educational problems. Contemporary opinions and the latest review and reports on the topic of his/her research.

For the present study, efforts were made to materialize the ideas discussed earlier. For literature search the investigator visited different works related to researches mainly. Also get lots of information regard subject from University library and references from friends, experts and relatives.

This chapter has the details of related literature for the present study. The chapter is divided into two broad sections.:

Theoretical Discussion   Reviews of related researches
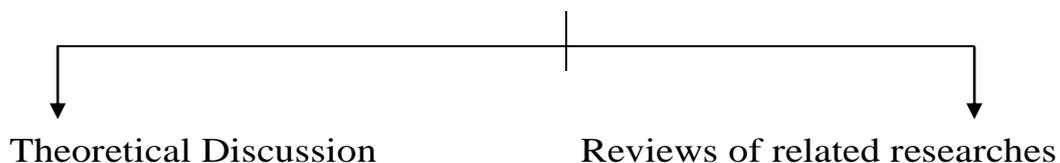
For theoretical discussion the investigator had selected the following objectives as directive landmarks of this review of literature. They are as follows :

1)   To familiarize the historical background on studies.

2)   To study the theoretical aspects and developments of attitude scales.

The details of the theoretical reviews of the literature is presented here:

2.2 HISTORICAL BACKGROUND OF ATTITUDES MEASUREMENT:

Attitudes can be difficult to measure because measurement is arbitrary, meaning people have to give a scale to measure it against, and attitudes are ultimately a hypothetical construct that cannot be observed directly. The measurement of attitudes is not a new field, since pioneers as H.H. Remmers and L.L.Thurstone have done work in this field for many years. Attitudes consist both of the verbalized concept and of the behaviour resulting from the attitude.[1]

Instruments used to measure attitudes usually are referred to as attitude scales." These scales are most widely used to measure attitudes. First attitude scale was devised by L.L.Thurstone in 1929. Although many elaborate techniques of scale construction have been developed which are as under :

1:    The equal-appearing interval scale by L.L. Thurstone.(1929)

2:    Scaled responses by Likert.(1932)

3:    Master scales by Remmer.

4:    Social distance scales by Bogardus. (1925)

5:     Unilateral approach scale by Guttman. (1950)

6:     Edwards scale (1957)

7:     Scalogram analysis by coomb.

8:     Latent structure analysis by Lazarfeld's (1959)

From above only two have come into wide use. These methods involve either scaled statements.

1:     The equal-appearing interval scale by L.L. Thurstone (1929)

2:     Scaled responses by Likert. (1932)

In present study researcher made a scaled responses by Likert method, thats why the information regarding this technique is given below.

The Theoretical Foundation variations origin analysis of attitude :

Definition :

A psychometric response scale primarily used in questionnaires to obtain participant's preferences or degree of agreement with a statement or set of statements. Likert scales are a non-comparative scaling technique and are unidimensional (only measure a single trait) in nature. Respondents are asked to indicate their level of agreement with a give statement by way of an ordinal scale.

Variations :

Most commonly seen as 5 point scale ranging from "Strongly Disagree" on one end to 'Strongly Agree' on the other with 'Neither Agree nor Disagree' in the middle; however, some practitioners advocate to use of 7 and 9 point scales which add additional granularity. Sometimes a 4-point (or other even-numbered) scale is

used to produce an ipsative (forced choice) measure where no indifferent option is available. Each level on the scale is assigned a numeric value or coding, usually starting at 1 and incremented by one for each level. For example :
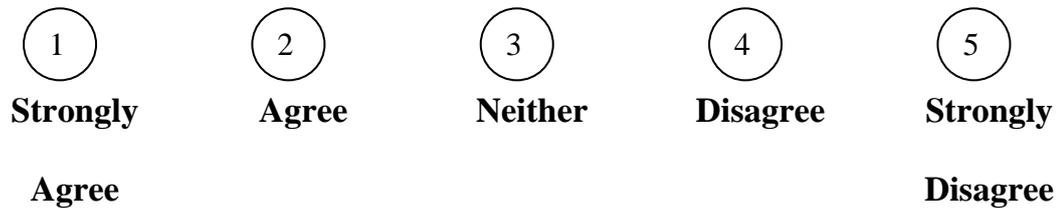
(1)	(2)	(3)	(4)	(5)
Strongly Agree	**Agree**	**Neither**	**Disagree**	**Strongly Disagree**

Figure 1. Sample scale used in Likert scale questions

Origin :

Named after Dr. Rensis Likert, a sociologist at the University of Michigan, who developed the technique. His original report entitled "A Technique for the Measurement of Attitudes" was published in the Archives of Psychology in 1932. His goal was to develop a means of measuring psychological attitudes in a 'scientific' way. Specifically, he sought a method that would produce attitude measures that could reasonably be interpreted as measurements on a proper metric scale, in the same sense that we consider grams or degrees Celsius true measurement scale.

Analysis :

For scoring the items a value of 5 may be given to the responses indicating strong agreement 4 for simple agreement, 3 for undecided 2 for simple disagreement and 1 for strong disagreement. Thus each individual can be assigned quantitative score for the measurement of his/her attitude.

2.3 THEORETICAL FOUNDATION OF ATTITUDE :

2.3.1 Meaning of attitude :

An attitude can be defined as a positive or negative evaluation of people, objects, event, activities, ideas or just about anything in our environment. [2]

2.3.2 Definitions of attitude :

"A psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor." [3]

"Readiness of the psyche to act react in a certain way." [4]

"A Mental and neural state of readiness, organized through experience exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related." [5]

"An evaluative disposition toward some object based upon cognitions, affective reactions, behavioral intentions and past behaviours that can influence cognitions affective responses, and future intentions and behaviors." [6]

Whittaker : "An attitude is a predisposition or readiness to respond in a predetermined manner to relevant stimuli." [7]

Thurstone : "The sum total of a man's inclinations and feelings, prejudice or bias, pre-conceived notions, ideas, threats and convictions about any specific topic." [8]

Britt: "An attitude is a mental and neutral state or readiness, exerting directive or dynamic influence upon the individuals' response to all objects and situations with which it is related." [9]

Krech and Crutchfield : "An attitude can be defied as an enduring organization of motivational, emotional, perceptual and cognitive process with respect to some aspect or the individual's world." [10]

Barr, David, Johnson: " An attitude may be defined as a learned emotional response set for or against something." [11]

L.L. Bernard : " The behavior which we define as attitudinal or attitude is a certain observable 'set' organism or relative tendency preparatory to and indicative of more complete adjustment." [12]

B.Vonhaller Gilmer : " An attitude can be defined as a tendency to respond positively or negatively to other people, to decisions, to institutions, and to organizations." [13]

Any definition that includes all of the connotative aspects implied by the term attitude must be broad and vague, yet it is necessary some how to limit this discussion to a specific concept. For this purpose an attitude is defined as a developmental state of organismic valence, created by psycho-biological processes, exerting a motivational influence upon the individual's responsive behavior in situations directly and indirectly related to it.

2.3.3 Concept of Attitude :

The concept of attitudes is an old one in psychology, and while we tend to associate it more directly with the area of social psychology, it was an important concept in general psychology in Germany at the turn of the twentieth century. It was first used in America by Franklin H. Giddings and was introduced into social psychology be William I. Thomas. The first American psychologist

to use the concept in a general textbook was Howard C. Warren, in his human psychology.

In the introduction to their book. Fishbein and Ajzen (1975) suggest that attitude is "characterized by an embarrassing degree of ambiguity and confusion."

Attitudes are indicative of our tendency to behave toward others. Attitudes are for or against. Attitudes are a result of stimulus and response as well as the muscular preparation for the response set-up in the neuro-muscular system. They are pre-conceived and they become part of our nature. It is something conscious, deliberate or international. If an individual says that capitalism is bad, it means that his mental set has become antagonistic toward capitalism. Thus, mental set theory involves a previously existing approach.

According to K. Young, "an attitude is essentially a form of anticipatory response, a beginning of action not necessarily completed."

Attitude have been defined as ideas with emotional content, important beliefs, prejudices, biases, predispositions, appreciations, and as states of readiness or set.

2.3.4 Features of attitude :
From above definitions of attitudes we are derived below features of attitudes.

1:      Attitude may be positive or negative.
2:      Attitudes result from our tendency to reach general conclusions on the basis of specific experiences.

3: To have an attitude toward something is to be biased favorably or unfavorably.

4: Attitudes develop and change in a number of different ways.

5: Cognitive attitudes closely resemble knowledge.

6: A well-established attitude is very difficult to dislodge.

7: Attitudes hinder or facilitate human relationships.

8: Attitudes conditions the decision-making and opinion forming process.

9: Attitudes are so obviously important in determining behavior.

10: Attitudes are more or less remain permanently.

11: Attitudes constitute one aspect of an individual's personality.

2.3.5 Elements that affect attitudes : [14]

1: Family

2: School

3: Media

4: Direct personal expenc

5: Related group

2.3.6 Dimensions of attitude :

When we speak of attitudes, most frequently we speak of whether the attitudes are favourable or unfavourable. Although this aspect of attitudes is certainly important, it is only one of the dimensions of attitudes, and the other dimensions may be equally important to the teacher whose aim is to make significant change in attitudes include, [15]

1: Favorableness

2: Intensity

3:      Salience

4:      Generality

2.3.7 Types of attitudes :

There are mainly two types of attitude :

1:      Positive attitude

2:      Negative attitude

2.3.8   Formation of attitude : [16]

According to Doob (1947), learning can account for most of the attitudes we hold. The study of attitude formation is the study of how people form evaluations of persons, places or things. Theories of classical conditioning, instrumental conditioning and social learning are mainly responsible for formation of attitude. Unlike personality, attitudes are expected to change as a function of experience. In addition, exposure to the 'attitude' objects may have an effect on how a person forms his or her attitude. this concept was seen as the "mere-Exposure Effect". Robert Zajonc showed that people were more likely to have a positive attitude on 'attitude' objects' when they were exposed to it frequently than if they were not, Mere repeated exposure of the individual to a stimulus is a sufficient condition for the enhancement of his attitude toward it. Tesser (1993) has argued that hereditary variables may affect attitudes but believes that they may do so indirectly. For example, consistency theories, which imply that we must be consistent in our beliefs and values. As with any type of heritability, to determine if a particular trait has a basis in our genes, twin studies are used. The most famous example of such a theory is Dissonance-reduction theory, associated with Leon Festinger, which explains that when the components of an attitude (including belief and behavior) are at odds an individual may adjust one to match the other (for example, adjusting a belief to match a behavior). Other theories include

balance theory, originally proposed by Heider (1958) , and the self-perception theory, originally proposed by Daryl Bem.

2.3.9 Attitude behavior relationship : [17]

The effects of attitudes on behaviors represents a significant research within psychology. Two theoretical approaches have dominated this research: the theory of reasoned action and, its theoretical descendant, the theory of planned behavior, both of which are associated with Icek Ajzen. Both of these theories describe the link between attitude and behavior as a deliberative process, with an individual actively choosing to engage in an attitude-related behavior. An alternative model, called MODE for "Motivation and Opportunity as Determinants" was proposed by Rusell H. Fazio, which focuses on motivations and opportunities for deliberative attitude-related behavior to occur. MODE is a Dual process theory that expects deliberative attitude-behavior linkages- like those modeled by the theory of planned behavior-only occur when individuals have motivation to reflect upon their own attitudes.

The theory of reasoned action (TRA), is a model for the prediction of behavioral intention, spanning predictions of attitude and predictions of behavior. The subsequent separation of behavioral intention from behavior allows for explanation of limiting factors on attitudinal influence. Theory of Reasoned Action was developed by Martin Fishbein and Icek Ajzen, derived from previous research that started out as the theory of attitude, which led to the study of attitude and behavior. The theory was "born largely out of frustration with traditional attitude-behavior research much of which found weak correlations between attitude measures and performance of volitional behaviors"

The theory of planned behavior was proposed by Icek Ajzen in 1985 through his article "From intentions to actions: A theory of planned behavior". The theory was developed from the theory of reasoned action, which was proposed by Martin Fishbein together with Icek Ajzen in 1975. The thoery of reasoned action was in turn grounded in various thories of attitude such as learning theories, expectancy-value theories, consistency theories of attitude such as learning theories, expectancy-value theories, consistency theories, [2] and attribution theory. [3] According to the theory of reasoned action, if people evaluate the suggested behavior as positive (attitude), and if they think their significant others want them to perform the behavior (subjective norm), this results in a higher intention (motivation) and they are more likely to do so. A high correlation of attitudes and subjective norms to behavioral intention, and subsequently to behavior, has been confirmed in many studies.[4]

A counter-argument against the high relationship between behavioral has also been proposed, as the results of some studies show that, because of circumstantial limitations, behavioral intention does not always lead to actual behavior, Namely, since behavioral intention cannot be the exclusive determinant of behavior where an individual's control over the behavior is incomplete. Ajzen introduced the theory of planned behavior by adding a new component, "perceived behavioral control." By this he extended the theory of reasoned action to cover non-volitional behaviors for predicting behavioral intention and actual behavior.

2.4 STATICS AS A SUBJECT : [18]

Statistics is the study of the collection, analysis, interpretation and presentation of data. It deals with all aspects of data including

the planning of data collection in terms of the design of surveys and experiments. When analyzing data, it is possible to use one or both of statistics methodologies : descriptive and inferential statistic in the analysis data. Statistics is described as a mathematical body of science that pertains to the collection analysis, interpretation or explanation, and presentation of data, or as a branch of mathematics. Because of its empirical roots and its focus on application, statistics specially considered a distinct mathematical science rather than as a branch of mathematics, Statistics is applicable to a wide variety of academic disciplines, including natural and social sciences, government, and business.

Nowadays Statistics is very important subject for science and commerce stream. It is also very useful subject for research work.

2.5 HISTORICAL BACK GROUND OF STATISTICS IN INDIA:

The subject of statistics and probabilities ideas in India seem to be of ancient origin in India. It is very interesting to note this statistics knowledge and probabilities ideas were attributed from the time of Mahabharat and Kautilya. During the Mauryan period had a detailed description of the system of data collection relating to agricultural, population and economic census in villages and towns during the period. Much later, the tradition of collecting data in detail contained during the period of Mughal emperor Akbar around 1590 A.D.

During the British period the statistical development was geared to towards administration, tax collection, revenue, trade and commerce and related activities. After independence in India in 1947, The country saw an urgent need for a statistical framework in

order do improve the quality and fill up the gaps in statistical information, it was decided to establish a National sample survey organization. [19]

Research Teaching and Training in Statistics :

The first important work in statistics in the modern sense to be undertaken in India was possibly the statistical analysis of examination in Calcutta University. Mahalanobis analyzed the data collected on Anglo-Indians in Calcutta and published a paper on statistical analysis of Anglo-Indian stature. He continued to work on anthropological data and developed the concept of statistic for classifying populations. The statistic is a powerful technique in multivariate analysis for classification problems and cluster analysis. The second major contribution of Mahalanobis to the field of statistics is in organization of large scale sample surveys. Starting with exploratory survey (pilot surveys) confined to a few square miles in Bengal in 1937, Mahalanobis was probably the first person to organize a large scale survey covering the whole of Bengal (about 50000 square miles) in 1941 cf. Mahalanobis). The three important contributions of Mahalanobis to the subject of survey sampling are pilot surveys, concept of optimum survey design and interpenetrating network of subsamples. All the three ideas are forerunners of important contributions to statistics: pilot surveys as a prelude to Wald's "sequential analysis", Optimum survey design as a precursor to "operations research" and IPNS technique as curtain raiser to resampling procedures such as "bootstrap" (Gohsh et. al.),

According to Nair who received his B.A. (Hons) degree in Mathematics in the year 1932 from the Maharaja's College of Science, Thiruvananthapuram affiliated to University of Madras, the only colleges which o ered an an optional (elective) paper in

Statistics in its honours curriculum was the Maharaj's College of Science and the Madras Christian college . There was also a Department of Economics and Statistics at the University of Madras around the years 1934-36. The main responsibility of the Lecturer in statistics in this Department was to teach Economic Statistics for an Evening Diploma course in Economics which the University has started for the benefit of graduates employed in government offices, colleges and private firms. "Huzurbazar writes "the topic of Probability was not included at any level in the Mathematics curriculum of Bombay University. Later I was a freshman at Rajaram College, Kolhapur, which has just made arrangements for the teaching of a "new course" in Mathematics as an alternative option to the usual "old courses" in Mathematics for the first two years in college. The interesting thing about this new course was that it introduced for the first time, elements of Probability and Statistics as optional to Geometry, Trigonometry and Mechanics in the old course in Mathematics. This new course in Mathematics was introduced in Bombay University in 1935". From these observations, it is clear that there was no undergraduate program specifically catered to the discipline of Statistics even through the subject of elements of Probability and Statistics was taught as an elective in the mathematics curriculum at some of the universities.

From the year 1932, the Indian Statistical Institute started the short training courses in Statistics which were attended by officers on deputation from the government and other organizations from all over India. These were the only training courses available until Mahalanobis started the first post graduate course in Statistics at Calcutta University in 1941. There were not many text books on Statistics and the teachers had to learn by reading original papers published in statistical journals. Apart from teaching faculty

members were also involved in research and made fundamental contributions to Multivariate Analysis, Construction of Designs, Sample surveys and Statistical Inference. Mahalanobis thought that a post graduate programme can be strengthened if the students get trained in statistics from the undergraduate program. He established an undergraduate Department of Statistics at the Presidency College, Calcutta. The post graduate Department of Statistics was started in 1948 by the Bombay University and in 1953 by the University of Pune. Other major universities which have contributed significantly to the development of the subject of Statistics during the early years are the universities of Madras, Mysore, Kerala, Guwahati, Andra and Lucknow. Post graduate departments of statistics were later started at other places in the country.

Evolution of the subject of Statistics in India is incomplete without an exhaustive discussion on the Indian Statistical Institute founded by Mahalanobis and its role. The Indian statistical Institute was founded as a society on December 17, 1931 and it introduced the Bachelor of Statistics (B. Stat.) and Master of Statistics (M. Stat.) and Ph.D. Degree programs in the year 1960 after the Institute was declared as an "Institute of National importance" by the government of India in view of the extensive contributions of the Institute to research and training in the subject of Statistics. Fisher's view that "teaching instruction or training in Statistics, at whatever level, is bound to be, on the one side with fact finding projects in the traditional statistical fields of demography and economics, and on the other side with opportunities to gain first hand familiarity with at least some field in natural sciences" was also held by Mahalanobis. The courses for the B. Stat. degree include some areas of biological, physical and geological sciences. Faculty at the Indian Statistical Institute (ISI) had made fundamental contributions to the subject of

Statistics. No treatment of such topics as linear models, estimation, maximum likelihood estimation can be complete without an appropriate coverage of work done at ISI. The Cramer Rao inequality, Rao-Blackwell theorem and Basu's theorem on independence of an ancillary and a complete sufficient statistic are part of any undergraduate or post graduate course in Statistical Inference.

During the forties, Mahalanobis recognized the need for introducing Statistical quality Control techniques for improving the quality of products produced by Indian Industries A special course was organized by ISI in 1945-46. He invited Walter Shewart who has done pioneering work in U.S.A. in statistical Quality Control (SQC) to visit ISI. Shewart conducted a one-week conference on "Standardization in Industrial Statisticas" in 1848 under the auspices of the ISI and the Indian Standards Institution. These activities in turn led to the starting of the first SQC unit by ISI in Bombay in 1953 and later at other cities in India. The main objective of the statistics of these units was to visit industries and act as consultants in SQC activities of the industries to improve the quality of their products.

Another Institute which contributed in a substantial measure to the development of Statistics in India is the Indian Agricultural Statistics Research Institute (IASRI). At the end of 1943, the government of India set up an enquiry committee to look into the causes of the devastating Bengal famine. The comittee observed that one of the main factors responsible for the famine was defective statistics of crop production available at that time. Sukhatme and his coworkers began research in the methods of collection of statistics of crop yield by developing survey techniques of yield estimation under

random sampling. There was a major scientific dispute between ISI and Indian Council of Agricultural research (ICAR) on the best method of crop-cutting experiments for the estimation of crop yields. After considerable experimentation with cuts of different shapes and sizes, Mahalanobis recommended the use of circular cuts of radius 4 feet for yield surveys and ISI had been using the same. As against this, ICAR had been using the rectangular cuts of size of length 33 feet and which 16.5 feet for crop yield surveys conducted by them. Studies conducted, to see the relative efficiency of two systems, however did not reveal significant differences between the two methods. Sastry, Adhikikari

In order to have an outlet for research contributions in Statistics emanating from India and other countries in the subcontinent, Mahalanobis founded and edited journal *Sankhya, The Indian Journal of Statistics from 1931*. He was the editor from 1931-1972. The first issue of the journal was published in June 1933. In an editorial published in the first issue, Mahalanobis explained why the name *Sankhya* seemed to be appropriate in the Indian context. In the editorial he said that "We believe that the idea underlying this integral concept of Statistics finds adequate expression in the Indian word *Sankhya*. In Sanskrit the usual meaning is 'number', but the original root meaning was 'deterministic knowledge'. In the Atharva-veda, a derivative from sankhyata occurs both in the sense of 'well-known' as well as 'numbered'" It was and it is now one of the internationally recognized journals in the areas of Probability and Statistics for its quality contributions.

Every investigator must know what sources are available in the field of inquiry and where and how any of them are worthy to be

used. The research worker needs up-to-date information regarding his problem i.e. what has been thought and done in the area.

With such understating the present investigator tried to review the past work done on achievement, attitude, learning, subjects and tool construction with special reference to the dependent variables of the study.

Many researches have been conducted on subject achievement. Researchers have conducted researches on achievement and its correlation with some aspects (e.g. intelligence, personality, sex and SES, etc.). The review of the relevant studies is presented in the following paragraphs into one major group:

1:     Attitude related researches

2.6   REVIEW OF ATTITUDE RELATED RESEARCHES:

2.6.1 Attitude Scale Construction :

<div align="center">STUDY : 1</div>

Subject	:	*A study of Attitude towards mathematics of Secondary Schools Students.* [20]
Researcher	:	R. Mishra, (Patna Uni., 1978)
The Objectives	:	To develop a Likert-type scale to measure attitude towards mathematics.
		To find out the relationship between attitude score and parent's qualification, parent's profession, parent's income, family size, type of schools attended by students and reading facility.

Sample	:	A stratified random sample of 505 students was selected from the population of class X and XI students of Patna Municipal Corporation for studying the relationship.
Tools	:	The tools developed by the researcher had seventy attitude statements of which thirty were finally accepted for the scale. The coefficient of reliability by the split-half method was 0.72

Findings :

The findings of this study are :

- Boys whose parents were better qualified and in prestigious professions, had more favorable attitude than others but this was not true in the case of girls.

- Boys and girls from rich families had more favorable attitude towards mathematics than those from poor families.

- The type of institutions attended earlier had no impact on attitudes.

- Boys and girls with study facilities had more favorable attitudes than others.

STUDY : 2

Subject	:	*Development and Standardization of Modernity Attitude Scale.* [21]
Researcher	:	C.L. Anand and M.A. Sudhirkumar, (Nehru,1981)
Objectives	:	To develop and standardize a Modernity Attitude Scale, as a five point Likert-type

forced choice scale consisting of five subscales assessing the social attitudes of the subjects.

To measure attitude towards religion, marriage, status of women in society and education

Sample   :   400 Adults from 400 households were selected randomly from two villages in Malabar in the state of Kerala.

Planning and Procedure :

Item analysis was carried out on responses of 370 subjects. Eighty best discriminating items were selected taking sixteen statements (eight positive and eight negative) from each of the five areas under study, for developing the final from of the scale.

The split-half reliability of the full-scale was found to be 0.76 and for the subscales it was found to range between 0.66 and 0.75. The test-retest reliability was found to be 0.72 and for the subscales it was found to range between 0.69 and 0.74.

The validity of the scale was assessed by finding correlations between the total scale and the score on each sub-scale using product moment method. Correlation 'r' ranged from 0.57 to 0.73. Percentile norms and stannines were developed.

STUDY : 3

Subject   :   *A scale for Measuring Attitudes of College Students towards Education.* [22]

Researcher   :   H.B. Badami, (School of Phil, Psy. Edu., Guj. Uni.,1973)

Objective   :   To construct a scale to measure the attitudes of

college students towards various aspects of education – instruction curriculum teaching methods, teachers and examination procedures.

Planning and Procedure	:	The Likert technique of developing an attitude scale was employed. Eighty five items were selected from earlier studies. The items covered five areas. On the basis of discussion with experts, the items were modified or rewritten. Five positive and five negative items for each of the five aspects of education were retained.
Sample	:	A sample of 100 respondents was randomly selected from three difference colleges of arts, commerce and science.

Reliability and Validity :

Item analysis was carried out by taking two extreme groups, namely, upper 25 percent and lower 25 percent. Critical ratios were calculated for each item. Eight Items having the highest values for each aspect were selected. Reliability indices were as follows :

Test-retest reliability was 0.77(N=40) :

The 'g' factor loadings and centroid factor loadings of the test varied from 0.75 and 0.87 and 0.761 to 0.865 respectively.

STUDY : 4

Subject	:	*Mysore Teacher Attitude Scales*[23]
Researcher	:	P.R.Nayar, (Dept. of Edu. Mys. Uni., 1977)
Objective	:	To construct and standardize attitude scales to measure four important teacher attitudes, namely, (i) attitude to teaching as a profession (ATP Scale), (ii) attitude to students in general

(ASG Scale), (iii) attitude to school work as a whole (ASW Scale), (iv) attitude to professional growth (APG Scale).

Sample : A representative sample of 400 teachers was taken.

Planning and Procedure :

The Likert technique was used in the construction of the scales. On the basis of opinions of a team of selected teacher-educators, thirty items on each attitude, more or less balancing the positive and three negative categories, were selected. Chi-square test was used for selecting discriminating items. The final form consisted of 110 statements. (ATP-25,ASG 30, ASW 30, APG 25).

Reliability and Statistical Calculation :

The split-half coefficients of reliability were 0.78, 0.83 and 0.98 for the ATP, ASG, ASW and APG scales, respectively. The scales were grouped into seven classes and the chi-square values of discrimination which significant at one percent level of significance, were computed for all the four scales.

Norms :

Percentile norms and the upper and the lower limits of the stanine classes were calculated with reference to the validation sample.

STUDY : 5

Subject : *A study of Scientific Attitude and Its Measurement.* [24]

Researcher : N.N. Shrivastava, (Ph.D., Edu., Patna Uni., 1980)

Objectives : To develop an instrument to measure scientific attitude.

		To compare science teacher and non-science teachers in respect of scientific attitude.
		To compare science students and non-science students in respect of scientific attitude.
Variable and Method of Scale	:	The thirty six item attitude scale in Hindi included six variables-retionality, curiosity, open-mindedness, aversion to superstition, objectivity-intellectual honesty and suspended judgment. Items were selected by the method of Thurstone's equal appearing interval and modified by the Likert method of summated ratings.
Sample	:	The test was administered on a random sample of fifty science teachers, fifty non-science teachers, 100 science students and, 100 non-science students from the population of Madhya Pradesh.
Reliability and Validity of the scale	:	Reliability and Validity of the scale were 0.90 and 0.94 respectively.

Findings :

- The amount of scientific knowledge or general exposure to science courses made impact on scientific attitude positively.
- Scientific knowledge helped in the formation of scientific attitude.
- Boys and girls differed in respect of scientific attitude.
- Male teachers and female teachers did not differ in respect of scientific attitude.

STUDY : 6

Subject : *Construction of Attitude Scales and Measurement of Attitudes of Students of Jalgaon District towards Mathematics.* [25]

Researcher : Kolhe S.P. (Ph.D., Edu., Poona Uni.,1985)

Objective : To find out the influence of sex and urban-rural location on the attitudes of students of class X towards algebra, geometry and mathematics as a whole.

Sample : 2000 grade X students from urban and rural secondary schools of Jalgaon District of Maharashtra State.

Tools : To collect data were three Likert-type scales developed by the investigator-one scale for attitude towards algebra, second for attitude towards geometry and third scale for attitude towards mathematics.

Reliability : Reliability as determined by the spilt-half using the Spearman_Brown Formula was 0.87,0.91 for algebra, geometry and mathematics on attitudes scales respectively.

Analysis of data : 't' test was used to examine the various null hypotheses formulated on the basis of objectives.

Findings :

- The students had favorable attitudes towards algebra, geometry and mathematics as a whole.

- There were significant differences between the attitudes of urban and rural students towards mathematics and algebra,

irrespective of the sex. Urban students had more favorable attitudes than rural students.

- There were no significant differences between the attitudes of urban girls and rural girls regarding algebra and geometry. Urban boys had more favorable attitudes than urban girals.

- There were significant differences between the attitudes of rural boys and rural girls towards mathematics as a whole, algebra and geometry. Rural boys had more favorable attitudes than rural girls.

- Boys had more favorable attitudes toward mathematics as a whole, algebra and geometry than girls, irrespective of the area they lived in.

Summary of Related Studies : (Study 1-6)

Reviewing in the studies presented here one finds R. Mishra(1978) C.L.Anand and M.A. Sudhir Kumar (1981) H.D. Badami (1973), P.R. Nayar (1977, N.N. Shrivastava (1980) S.P. Kolhe (1985) have worked specially for the construction and standardization of attitude scale. Some studies concentrate on school subjects like mathematics in particular while one on education in general, one measures teacher's attitude, one the scientific attitude and is modernity scale.

Area and Sample :

These studies have been conducted in different palaces. The mathematics attitude scale (1970) was standardized on 505 students of class X and XI of Patna, whereas the other mathematics attitude scale had 2000 grade X students of Jalgaon, Maharashtra as sample.

The tools have been constructed in different parts of India and the sample ranges between 400 to 2000 subjects. The stratified random samples have been selected.

Tool and Method :

R. Mishra's (1978) attitude towards mathematics scale has 30 statements modernity attitude scale of C.L.Anand and M.A. Sudhirkumar (1981) has a total of 80 items, sixteen in each area, H.D. Badami's College Students Attitude toward Education Scale has 50 items concentrating on five aspects. P.R. Nayar (1977) has 110 statements (ATP 25, ASG 30, ASW 30, APG 25). Scientific Attitude measurement scale has 36 items.

Findings :

R. Mishra (1978) found parent's profession had effect on the attitudes of boys towards mathematics, but the institution types did not have impact on attitudes. S.P. Kolhe (1985) remarked that there was significant difference between the attitudes of urban and rural students irrespective of the sex.

N.N. Shrivastava (1980) found sex difference in respect of scientific attitude in the case of students.

These scales were standardized. The reliability and validity was found out.

Preview of Studies Pertaining to Attitudes :

General Attitude Studies (Study 7-12) :

STUDY : 7

Subject	:	*A study of population Education Knowledge and Attitudes of Secondary School Student and Teachers.* [26]
Researcher	:	K. M. Bhandarkar, Ph.D., Edu., Bhopal Uni.,1963)
The Objectives	:	To study population education including the knowledge about population and attitudes of secondary school students and teachers.
		To study their relationship with other useful components of position education.
Sample	:	142 teachers and 1500 students of 22 urban and rural schools, were included in the sample.
Tools	:	A population Education Knowledge Test and an Attitude Scale were specially constructed for the study.
Analysis of Data	:	The data were analysed by using descriptive statistics.
		't-test' and product moment correlation were used for drawing conclusions.

Conclusions:

- Secondary school students in general possessed a poor knowledge of population education but they had a moderately favorable attitude towards it.

- The secondary school teachers had moderate knowledge and a favorable attitude.

- Male and female students differed significantly in their knowledge and attitude towards population education. Female students scored higher or both.

- Students of arts had better knowledge than students of biology, mathematics and commerce groups.

- The biology and arts students had more favorable attitudes that students of commerce and mathematics.

STUDY : 8

Subject : *Trying out a study of Bringing about Attitudinal Changes in the context of Population Education.* [27]

Researcher : H. G. Sattarshakawala, (Ph.D., Edu., S.G. Uni.,1981)

Objectives : To prepare and tryout an attitude scale to know the attitude of the students of class IX, people in general, and field-workers in the family planning programme towards population education.

To study the effect of a multimedia learning package on the attitude towards population education.

Sample : In all 1000 students of class IX, 100 field-workers in the family planning programme (equal number of both sexes) were selected from urban as well as rural areas of Surat district.

Tools : Attitude scale on Population Education for data

collection and a learning package prepared by Urmila Nanavati was used for instruction.

Planning and : Pretest and post-test single group design was
Procedure made. Difference were tested for significance by using 't'-test for correlated means.

Findings :

- The whole group that was exposed to the treatment of the learning package showed significant positive improvement (0.01 level) in their attitude towards population education.

- The field-workers in the family planning programme did not show any significant improvement in their attitude towards population education after the use of the learning package.

- The male and female students of the general population after the use of the learning package showed significant positive improvement a 0.05 level in their attitude towards population education.

- There was no significant difference between the male and female sample in the change of attitude towards population education.

STUDY : 9

Subject : *A study of Attitude towards National Defence and Social Values as Resultant of Socio-Economic Status and Sex.* [28]

Researcher : G.S.Adhikari (Ph.D., Psy., Kum.Uni.,1981)

Objectives : To study the attitude of rural and urban students towards .... defense.

To find out the relationship between

		n...defense and socio-economic status. (SES)
		To identify the social values of students in relation to their a... towards national defense.
		To understand the relationship between sex and attitude to national defense.
Sample	:	A sample of 690 students was chosen randomly from recon high schools and intermediate colleges of Kumaun region.
Tools	:	The National Defense Attitude Scale (NDAS), SES and Measurement Scale were administered among sample subject collect the data.
Analysis of Data	:	The data was analysed with the help of Mean, S.D. and t-test.

Findings :

- No significant difference was found between the rural and students in the attitude towards National Defense.

- The students coming from different SES strata were found almost similar in their attitudes towards National Defense.

- No remarkable difference was identified in the level of N Defense Attitude of RB and RG as well as of UB and RG.

- The rural and the urban boys of all groups of SES were more or less similar in their social values.

STUDY : 10

Subject	:	*Factory in the Attitude Formation towards Democracy.* [29]
Researcher	:	A Ahmad (Ph.D.,Psy., A.M. Uni., 1965)

Objectives	:	To identify the factors in attitude formation towards Democracy.
Sample	:	The sample comprised of 192 university students spread over the whole range of university training from the pre-university class to the M.A. final class.
Tools	:	Three scales, namely, non-violent, Non-co-operation Attitude Scale (Roy Chowdhury and Ahmad), Eysenck's Inventory of Social Attitudes, and F-Sealer (fascism) supposed to measure Democracy in an indirect, and F-scale way, were used to collect data.
Analysis of data	:	The chi-technique was used to study attitude formation towards Democracy with special reference to control and experiment groups selected under the age factor.

Findings :

- In the case of age, significant patterns of correlation were observe with reference to authoritarian-submission, anti-interception, power and toughness and destructiveness and cynicism.

- In the case of sex, significant patters of correlation were observed with reference to non-violent co-operation, radicalism-conservation, fascism, authoritarian submission, authoritarian aggression, power and toughness and destructiveness and cynicism.

STUDY : 11

Subject	:	*An investigation into effect to teacher's effectiveness teachers' responsibility and experience of teachers on professional attitude of teachers.* [30]

Researcher	:	J. H. Pancholi, (Research Article, 1996-2001)
Objectives	:	To measure the teacher's effectiveness.
		To measure the teacher's responsibility.
		To measure the teacher's attitude towards their profession.
		To study the main effect of independent variable. (Teacher effectiveness, teacher responsibility and experience on the teacher attitude towards their profession.)
		To study the impact of interaction of independent variables on the teacher's attitude towards profession.
Sample	:	The investigator selected 40 schools randomly and 540 secondary teachers from those schools.
Tools	:	For measuring the responsibility of the teacher's investigation adopted the tool prepared by Dr. Pramodkumar and D.N. mut, which is translated into Gujarati and modified by Dr. D.N. Patel and Dr. A. V. Patel
		for measuring the effectiveness of the teacher's investigator adopted a tool of Thomas R. Guskey which is translated into Gujarati and modified by Dr. B. D. Dave
		Dr. S.P. Ahluwalia teacher's attitude scale was used to measure the teacher's attitude towards their profession.
Research Design	:	The 2x2x2 Factorial design was selected with two levels each of teachers' effectiveness, teacher's responsibility and experience of teaching.

Analysis of data	:	Three way analysis of variance technique was employed to study the various effects of independent variables.

Findings :

- Teachers effectiveness is the strongest predictor of teachers attitude toward their profession. High effective teacher possess higher positive professional attitude than low effective teacher.

- The second predictor of teacher's attitude towards their professional is teachers' responsibility. High responsible teacher possesses high positive professional attitude than low responsible teacher.

- Long teaching experience teacher possess high professions attitude than short teaching experience teacher, but it is not significant.

STUDY : 12

Subject	:	*A study of the Value, Adjustment, Attitude towards Teaching towards Teaching Profession and Academic Achievement of Teacher's children as compared to Non-Teachers' Children.* [31]
Researcher	:	Mansukhbhai C. Nandani (Ph.D., Sau.Uni.,Rajkot, 1991)
Objectives	:	To study values of teachers' children in comparison with non-teachers' children.
		To study the attitude towards teaching profession of teachers children in comparison with non-teachers children.
		To study the academic achievement of teachers

children in comparison with non-teacher's children.

To construct a value scale in Gujarati Language for the students of grade VIII to X.

To construct a Likert type attitude scale in Gujarati Language for the students of grade VIII to X to study the attitude towards teaching profession.

Sample : Stratified random purposive sampling technique was followed in the present study. Twenty four schools were selected. From these schools 691 teacher's children (366 boys and 325 girls) were selected. Corresponding same number of non-teacher's children were taken from the same school, same grade and of the same sex.

Tools : Following tools were used for measuring the dependent variables :

Value Scale constructed by the researcher

Adjustment Inventory developed by K.G. Desai

Likert type Attitude Scale to assess attitude towards teaching profession, constructed by the researcher.

Result sheets of annual examination of schools for obtaining the measures of academic achievement in case of grade VIII and grade IX and result sheets of S.S.C.E. Board Examination in case of Grade X.

Procedure : The obtained data were organized in tabular form and statistical analysis of the data was made by applying 't' test.

The measures regarding the four dependent variables of teacher's children were compared with those of the non-teachers' children and then the findings in regard of each hypothesis were noted.

Findings :

- The difference in the mean scores on the attitude scale between teachers' children and non-teacher's children was not significant.

- The difference in the academic achievement between the teachers' children and the non-teacher's children was significant and in favor of teacher's children.

Summary of Related Studies : (Study 7-12)

This collection of 15 studies related to attitude. These studies have attitude as one of the variables. This again is sub-divided into two sections.

(i) General attitude studies
(ii) Attitude studies related to school subjects.

(i) There are 6 studies, about attitudes towards different aspects :

K.M. Bhandarkar (1983) has study of attitude of students and teachers towards Population Education, H.G. Sattarshakwala (1981)

makes attempt to bring about attitudinal change in the context of Population Education. G.S. Adhikari (1981) has a causal comparative study of attitude towards National Defense and social values. A Ahmad (1965) attempts to study the factors helpful in the formation of attitude towards Democracy.

J.H. Pancholi (2001) studies the effect of some variables on the professional attitude of teachers. Mansukh Nandani (1991) has compared the achievement of teacher and non-teacher children with attitude as a variable.

Area and Sample :

These five studies have 1500 students and 142 teachers from Bhopal, 1000 students and 100 field workers from south Gujarat, 690 students of Kumaun region, 192 university students of Chennai and 540 teacher of schools of North Gujarat, 691 teacher's children and 691 non-teachers' children as sample respectively.

Tools and Methods :

All these studies are interested in seeing the attitudes towards particular aspect and /or its impact, 80 they have tried to take already constructed tools in most cases. K.M.Bhandarkar (1983) has developed the tools, J.H. Pancholi (2001) has used the ANOVA technique for analysis. Most of the studies have used 't' test technique for analysis.

Findings :

In K.M.Bhandarkar's study sex difference was observed in the knowledge and attitude towards population education. Students of biology and arts possessed more favorable attitudes them of commerce and mathematics.

H.G. Sattarkhakwala found that change in attitude could be brought by giving treatment of learning package. In the case of attitude towards National Defense no significant difference was found because area, sex or SES difference. In J.H. Pancholi's study teachers' effectiveness came out as the strongest predictor of teacher's attitude towards their profession

Nandani's study observed achievement difference in favor of teachers' children, but no difference in case of attitude.

Attitude Studies Related to School Subjects : (Study 13-20)

STUDY : 13

Subject	:	*Mathematical Creativity as related to Aptitude for Achievement in and Attitude towards Mathematics.* [32]
Researcher	:	M.R. Tuli, (Ph.D.,Edu.,Punjab Uni.,1979)
Objectives	:	To find out the relationship between mathematical creativity and attitude towards mathematics.
		To study the contribution of mathematical creativity towards achievement in mathematics.
		To find out the contribution of attitude for mathematics and attitude towards mathematics to mathematical creativity.
Sample	:	1000 students were selected from Grade IX of high/higher secondary schools of Punjab State.
Tools	:	The research tools administered were,
		Balka's Creative Ability in Mathematics Test (CAMT) translated into Hindi by the

investigator.

The revised version of Different Aptitude Tests for higher secondary schools by J.M. Ojha (the Hindi adaptation from L of the battery of Differential Aptitude tests prepared by Bennet, Wesiman, and Seashore.

Mathematics Attitude Scale (MAS) developed and validated by the investigator himself.

Findings :

- Mathematical creativity was significantly positively related to aptitude for mathematics.

- The attitude towards mathematics was not found to be a predictor of creative abilities in mathematics.

- Aptitude for and attitude towards mathematics conjointly did not contribute to mathematical creativity in the present study.

STUDY : 14

Subject   : *A Critical study of Scientific Attitude and Aptitude of the Students and Determination of some Determinates Scientific Aptitude.* [33]

Researcher   : S. Ghosh, (Ph.D., Edu., Kal.Uni.,1986)

Objectives   : To ascertain the aptitude of the students with the help of a specially developed scientific aptitude test.

To appraise the extent of scientific attitude of the students with the help of a specially developed attitude test.

To find out the extent of academic motivation

of the students with the help of an SES questionnaire.

To find out sex-wise and strata-wise differences, if any, in the scientific aptitude and scientific attitude of the students.

To determine relationship between the scientific aptitude and variables such as scientific attitude and academic motivation of the students.

To develop a regression question of the scientific aptitude on the independent variables identified by the researcher.

Tools : The researcher use the following tools :

A scientific attitude test was developed

A scientific aptitude test was standardized.

Bhattacharya's Academic Motivation Test.

Kuppuswamy's (Urban) and Pareek's (Rural), SES Scales.

Analysis : Central tendency, Variability, ANOVA, Correlation, F-test and t-test were used for analysis.

Findings :

- Boys did not possess better scientific attitude than girls.

- There was a positive relationship between scientific aptitude and scientific attitude, scientific aptitude and academic motivation, and scientific attitude and academic motivation.

- Students having high scientific attitude were superior to those having low scientific attitude with respect to their scientific aptitude.

- Urban students belonging to the high SES group had more scientific aptitude than urban students belonging to the low SES group.

- Rural students belonging to the high SES group did not show better scientific attitude than rural students belonging to the low SES group.

STUDY : 15

Subject	:	*General teaching Competency and Attitude of Economics Teachers and their Relationship with Student Morale and Student Achievement in Government Schools of Delhi.* [34]
Researcher	:	Damyanti Pandey,(Ph.D., Pub. Meerut Uni.,1997)
Objectives	:	To study the general teaching competency of male and female teachers of Economics.
		To study the attitude of male and female economic teachers towards the teaching profession.
		To study the morale and achievement of boys and girls students of Class XII
		To find out the difference in general teaching competency and attitude of male and female teachers.
		To find out the difference in student morale and their achievement of boys and girls.
		To study the relationship of
		general teaching competency with attitude of economics teachers, student morale and their achievement.

teacher attitude with student morale and there achievement.

Student morale and their achievement.

Sample : The sample consisted of 75 teachers teaching economics to class XII of Government Senior Secondary Schools of South and West district of Delhi and 1300 students taught by these teachers.

Tools : General teaching competency Scale by Passi and Lalitha (1979)

Teacher attitude scale developed by Goyal (1980)

Test of student morale constructed by Bhatnagar (1982)

A student achievement test in economics constructed by the investigator herself.

Analysis of : The data collected were statistically treated
data through computer in which 't-test' and Person Product Moment Correlation Coefficient were computed. Data were then tabulated, analysed and interpreted.

Findings :

- No significant difference is found in the mean scores of male and female teachers in the teaching competency.

- There is significant difference in attitude of male and female economics teachers.

- There is significant difference between the mean scores of morale of boys and girls.

- There is no significant difference between the mean score of different categories of students based on their sex.

STUDY : 16

Subject : *Higher Secondary student's Achievement in Physics as Related to their Attitude towards the Study in Physics.* [35]

Researcher : S. Rajsasekar, (Research Article, Sept. and Dec., 2001)

Objectives : The present investigation is intended to find out:

The levels of achievement in Physics of the Second Year Higher Secondary Students.

The levels of their favorableness or unfavorableness, in respect of their attitude towards the study of Physics.

The significance of the difference between the sub-samples in respect of their achievement in Physics.

The significance of the difference between the sub-samples in respect of their attitude towards the study of physics and

the nature of the relationship existing between their achievement in Physics and their attitude its study.

Sample : As many as 821 Second Year Higher Secondary Students who had physics as one of their electives in addition to mathematics, chemistry and biology were taken as sample.

Procedure : The investigator constructed and standardized an achievement test in physics for higher

second year students and a scale to measure the attitude of the higher secondary students towards the study of physics.

These two tools were administered to the entire sample.

Test of significance was used.

Findings :

- Large number of the higher secondary students have a high level of achievement in Physics.

- Large number of higher secondary students had a favorable attitude towards the study of Physics.

- The gender of the students could cause no significant difference in respect of their achievement in Physics.

- The rural students were found to be better than their urban counterparts in their achievement in Physics and also in their attitude towards the study of Physics.

- The government school students were found to be better than their private school counterparts in this regard.

- There was significant and positive relationship between the higher secondary students achievement in physics and their attitude towards the study of Physics.

STUDY : 17

Subject : *Environmental Influence, Academic Achievement and Scientific Aptitude as Determinants of Adolescents Attitude towards*

Science Stream. [36]

Researcher	:	Bandyopadhyay J., (Ph.D., Cal.Uni.,1984)
Objectives	:	To assess adolescent students attitude towards science.
		To find out the environmental and academic factors that influence their attitude towards science.
Sample	:	Stratified random technique, consisted of 420 adolescent student 221 boys and 199 girls, from 21 schools of Calcutta.
Tools	:	Researcher made Information Schedule to know the responde... generalities. leisure activities, family background, relations parents, peers and teachers, and social influences, and sub-test the DAT battery on numerical ability, mechanical reasoning space relation. Achievements in school subjects were obtained from the annual examination records for last three years. The Scientific attitude was measured by Science Attitude Scale of Avinash Green (Published.)
Analysis of Data	:	The data were represented by charts and tables and analyzed statistical tools like 't'-test, ANOVA and Chi-Square.
Findings	:	

- Pupils having a high positive attitude towards science and negative attitude towards science were different with respect to independent variables either in isolation or in interaction.

- The obtained casual factors were environmental, attitudinal achievement related. Parent education, and SES led to favorable attitude towards science. Teacher's influence, peers' influence, vocational value of science and future aim of life were other contributory factors. The pupils who had a favorable attitude to science possessed higher ability in mechanical comprehension and visualization of subjects in space.

STUDY : 18

Subject	:	*Attitude toward Physics and Cognitive Preference styles among Different Groups of Science Students.* [37]
Researcher	:	Saxena A.K., (Ph.D. Edu., Raj. Uni., 1985)
Objectives	:	To develop a Physics Cognitive Preference styles Test (PCPST) and Attitude Towards Physics Scale (ATPS)
		To assess cognitive preference styles of different group of science students of both sex studying in classes X and XI of central schools and schools of Rajasthan.
		To assess the students attitudes to Physics.
		To study the relationship between attitudes and cognitive preference styles.
		To study the main and interaction effects of class, sex, and type of school on attitudes and cognitive preference style.
Analysis of Data	:	The 2 x 2 x 2 factorial design was considered
Sample	:	1766 students constituted the sample of the study.

Tools : Recall, Principles, Questioning and Application were the dimensions of the Physics Cognitive Preference Styles Test whereas enthusiasm in Physics learning, views on Physics as a process, views on physics learning the attitude towards physicists constituted the dimensions of ATPS.

:

Findings :

- The cognitive preference style of the entire sample was found to be R-A-O with maximum preference for Recall and minimum preference for Questioning.

- The science students of different groups differed only in their 'principles' and 'application' preferences for the second and third ranks only.

- 'Class' and 'type of school' had no effect on choices of preferences.

- The correlation coefficients between attitude towards physics scores and respective R-P-A and Q scores were found to be 0.58, 0.102, -0.25 and 0.005 respectively.

STUDY : 19

Subject : *To study the Attitude of Secondary School Students towards various School Subjects.* [38]

Researcher : P.V. Buddhdev (Ph.D.,Sau.Uni., 1969)

Objectives : To study the attitude of the school student

toward seven different subject with reference to six independent variables.

To study the correlation of attitude of secondary school students between different subject.

To study the change in the attitude towards mathematics by mastery learning package.

Sample	:	The sample of the study is 2,258 students from Std. VIII to X, among them 1293 are boys and 965 are girls.
Research Design	:	For the first two objectives the survey method is employed for data collection. The change in attitude is studied by experimental method using the two group pre-test, post-test design.
Tools	:	Desai-Bhatt Group Test of intelligence for measuring intelligence. Socio-Economic scale constructed by Dr. K.G.Desai Self constructed attitude scale for measuring attitude towards different subjects on semantic differential pattern.
Analysis of data	:	The 't'-test and analysis of co-variance techniques were employed for finding out the significance of difference. The correlation in the attitude towards different subject was found by product moment 'r'. Factor analysis technique was used to study the fundamental factors underlying the difference in the attitude towards different subject.

STUDY : 20

Subject	:	*Contribution of Cognitive and Affective Variables in Prediction of Achievement in Mathematics of Grade X Students.* [39]
Researcher	:	Pravina V. Budhdev, (ASC,Sau. Uni., Rajkot,1992)
Objectives	:	To establish regression question for the prediction of achievement in mathematics on the basis of attitude towards mathematics, intelligence and SES
		To study the contribution of attitude towards mathematics, intelligence and SES in predicting achievement in mathematics.
Sample	:	The sample consisting of 700 grade X student, was selected using stratified random sampling technique. These students belonged to 18 secondary schools of Rajkot city.
Tools	:	Desai-Bhatt Group intelligence test (Verbal) Socio-Economic Status Scale (SES) Attitude Scale (Budhdev Attitude Scale)
Analysis of Data	:	The data were analyzed through regression analysis technique. The regression weights were also computed for developing the regression equation.
Findings	:	
	-	The regression equation can be used for predicting the achievement in mathematics of Grade X subjects provided the measurements on attitude towards mathematics, intelligence and SES are available.
	-	Attitude towards mathematics, intelligence and

socio-economic status were the effective predictors for achievement in mathematics of Grade X students.

- Intelligence was the main contributor to predict achievement in mathematics.

- Attitude towards mathematics contributes 8 percent.

- The attitude towards mathematics, intelligence and SES appear to contribute 34.67 percent on achievement in mathematics.

Summary of Related studies (Study : 13-20)

In this section there are eight studies M.R. Tuli (1979) studied aptitude for achievement in and attitude towards mathematics, S.Ghosh (1986) studied the scientific attitude, Damyanti Pandey (1997) took up attitude of Economics teacher and its impact on student's achievement. S. Rajasekar (2001) studied the relationship between attitude towards Physic and achievement in Physics. J. Bandopadhyay (1984) studied the determinates of attitude towards science stream, and A.K.Sexena (1985) took up the study of attitude towards Physics and cognitive preference styles among different groups. P.V. Budhdev (1989,1992) has attempted to study the attitude of secondary school students towards different school subjects.

Area and Sample :

These studies being associated with achievement have a sample of school students from different areas. Tuli (1979) had grade IX, 1000 students from schools of Punjab, Pandey (1997) selected 75 teachers and 1300 students of class XII from Govt. Senior Secondary Schools of South and West district of Delhi. Rajasekar (2001)

selected 821 students of class XII, Bandyopadhyay (1984) selected 420 adolescents from School of Calcutta. Saxena selected a sample of 1766 pupils of class X and XI of Central Schools of Rajasthan. Budhdev (1989,1992) selected 225 students of Rajkot city from Std. VIII to X.

Tools and Method :

The researchers have employed necessary tools for the studies. Most of the research tools and the variables are standardized, whereas in the study of attitudes some researchers have developed their own tools. Tuli (1979), Ghosh (1986), Budhdev (1989) developed attitude scales for their study. Budhdev used semantic differential technique for the attitude scale.

Findings :

Tuli (1979) did not find attitude towards mathematics as a predictor of creative abilities in mathematics. Ghosh (1986) found a positive relationship between scientific aptitude and scientific attitude and the boys possessed more favorable attitude then the girls. Pandey (1997) too observed difference in the attitude of male and female economics teachers. Rajsekar (2001) found area difference in the students attitude the study of Physics. Bandyopadhyay (1984) observed significant difference in the environment and academic factors of students having favorable attitude towards science. Saxena (1985) found positive and high correlation between attitude towards Physics and respective R-P-A. Budhdev (1992) concludes that attitude towards mathematics intelligence and SES were the effective predictors for achievement in mathematics of grade X students.

STUDY : 21

Subject	:	*A study of the impact of self instructional material on sex education on adjustment, neuroticism and attitude towards sex of high school students. (Ph.D.) Uchat D.A.)* [40]
Researcher	:	B.V. Vachcharajani (Ph.D., Sau.Uni, 1988)
Objectives	:	To prepare self instructional on sex education.
		To study the impact instructional material on sex education, on adjustment, neuroticism and attitude sex of high school students.
		To study the effect to treatment, standard, sex and their various interactions on adjustment, neuroticism and attitude towards sex of high school student separately.
Population and sample	:	For the present study the researcher limited the population to the students of Std X and XII of the Gujarati Medium schools of Rajkot district. Five hundred forty seven students of std. X and XII of Gujarati Medium Schools of Rajkot District (urban and rural areas) have been covered as sample for experiments.
Tools	:	Three tools were utilized. For measuring attitude toward sex attitude scale was developed. Two readymade inventories for measuring, neuroticism and adjustment were selected.
Research Method	:	This was an experimental study.
Analysis of the data	:	t-test and factorial analysis of variance were used.

Findings :

- The self instructional material on sex education had no effect on the adjustment of boys and girls of std X and std XII of urban and rural area.

- The self instructional material on sex education had positive effect on the neuroticism of girls of std X and std XII, or urban and rural area whereas it had no effect on the neuroticism of boys of std X and std XII of urban area, and std. X of rural area.

- The self instructional material on sex education had positive effect on the attitude towards sex of boys and girls of std. X and std XII of urban and rural area.

- The treatment standard and sex had significant effect separately on adjustment and neuroticism for urban area, whereas the treatment and the standard had an effect separately on attitude towards sex for urban area.

- There were no significant effect of interactions between treatment, standard and sex on adjustment and neuroticism for urban area. The interactions between the sex and the standard had produced differential effect on attitude towards sex for urban area.

- The treatment and sex had no significant effect separately on adjustment and neuroticism for rural area, whereas the treatment had no effect on attitude towards sex for rural area.

- There was no significant effect of interactions between treatment and sex on adjustment, neuroticism and attitude towards sex for rural area.

STUDY : 22

Subject	:	*A study of parent's attitude towards the school programmes in Central Thailand.* [41]
Researcher	:	Pukprayoom, Suwimon (Ph.D., Vir Narmad Uni.,1984)
Objectives	:	To provide a reliable and valid tool to measure the attitude of parents towards the secondary school programme.
		To measure the attitude of parents students studying in lower secondary schools towards the school programme.
		To study the significant difference in the attitudes of these parents and lowly educated parents.
		To study the attitudes of parents having high status occupation and those having low status occupation.
Population & Sample	:	All parents of the children studying in lower secondary schools at Central Thailand were the population, whereas 1000 parents were selected as sample by purposive sampling method.
Tools	:	Attitude Scale (Thurston method)
Research method	:	Experimental as well as survey.
Data Analysis Technique	:	Analysis of variance Q-value.

Findings

- The parents from urban area have more favorable attitude towards the lower secondary school programme than those from rural area.

- The highly educated parents have more favorable attitude than the lowly educated parents.

- The status of occupation has influence upon the attitude of parents. The parents holding high status occupation have more favorable attitude than those holding low status occupation.

- There were no interactions in the parents attitude between the two variables, namely sex and education and sex and occupation.

- Area, sex, education and occupation of parents are not interacted so far as the parents attitude towards the school programme is concerned.

- There are interactions in the parents attitude between the three variables, namely area, sex and education and area education and occupation.

STUDY : 23

Subject : *A study of Attitudes of Teachers, Parents and Educational Administrators of Mehsana and Patan District towards introducing English from Grade I to IV of Primary Education.* [42]

Researcher : G.N. Chaudhary, (Ph.D., Vir Narmad Uni,2003)

Objectives	:	To know the attitudes of teachers towards English, specially working Primary School.
		To know the attitudes of parents towards English
		To know the attitudes of teachers towards English with respect to their sex and their area of school
		To know the attitudes of parents towards English in relation to their area.
		To know the attitude of educational administrators towards English with respect to their sex.
		To construct the attitude scale to measure attitude of teachers, parents and educational administrators.
Population & Sample	:	Teachers, Parents and Educational Administrators related to Primary Education from Mehsana and Patan Districts were forming the population of the parent study. A stratified sample was collected from the population which contained 750-750 subjects each from rural and urban area (a total of 1500 subjects), which was including 900 teachers, 450 parents and 150 educational administrators.
Tools	:	Investigator Constructed Attitude Scale [for Primary School Teachers, Parents and Educational Administrators] i.e. Attitude Towards English.
Research Method	:	Survey.

Data Analysis
Technique : Mean, Variance, t-test, coefficient of correlation, ANOVA, 2x2x2 ANOVA.

Findings

- The sex has no significant effect on the attitude of teacher toward English.

- The teachers' qualification has significant effect on the attitude towards English.

- The area has no significant effect on the attitude of parents towards English.

- Sex has no significant effect on the attitude of parents towards English.

- The parents high qualification has significant effect on the attitude of parents towards English

- The educational administrators qualification has no significant effect on the attitude of educational administrators towards English.

STUDY : 24

Subject : *A study of Attitudes of standard 8th students towards Mathematics.* [43]

Researcher : Namrataben K. Patel. (A research paper presented in issue of kcg journal of education August September 2012)

Objectives : To study the attitude towards success in mathematics of the students of standard 8th of primary schools under taking by Valsad

District's Panchayats.

To study the attitude towards success in mathematics with reference to sex of students of standard-8th of primary school under taking by Valsad District's Pancyatas.

To study the anxiety towards mathematics with reference to sex of students of standard – 8th of primary schools under taking by Valsad District's Panchayats.

To study the motivation towards mathematics of students of standard 8th of primary schools under taking by Valsad District's Panchayatas.

To study the motivation towards mathematics of students of standard 8th of primary schools under taking by Valsad District's Panchayatas.

To study the confidence towards mathematics of students of standard -8th of primary schools under taking by Valsad District's Panchayatas.

To study the confidence towards with reference to sex of students of standard -8th of primary schools under taking by Valsad District's Panchayatas.

To study the usefulness of math3ematics by students of standard-8th of primary schools undertaking by Valsad District's Panchayatas.

Population & Sample	:	Population for the present study was primary schools of Valsad District, under taking by Valsad District's Panchayatas, in which standard 8th is being started from academic year 2010-11.

Each taluka of Valsad District was selected for

sample. From every taluka, six schools are selected randmoly using by lottery technique. From this all school total 661 students were selected including 326 Girls and 335 boys.

Tools : Present study, a standard scale – "Fennema-Sherman math attitude scale" is referred. This tool is standard tool and made in foreign and very popular tool to measure student's attitudes toward math. This tool contains nine sections. From this five section is selected by Vashi (2006) and translated Gujarati language. This translated tool is again standardized for South Gujarat. So researcher use this attitude scale in Gujarati language.

Analysis techniques : For the statistical, chi-square test, percentages are used. Also average score is calculated and according to average score priority rank is given.

Findings

- Students want success in mathematics.
- Girls want to be more successful than Boys in Mathematics.
- Boys have more worry than Girls in mathematics.
- Students are self motivated in mathematics.
- Girls having more self motivation than Boys.
- Students are having a good self confidence of mathematics.
- Students think that mathematics is useful.
- Students are having anxiety about mathematics exam.
- Students calculate in mathematics joyfully.
- Students like to perform well in mathematics.

- Students believe that to live life, the knowledge of mathematics is important.

STUDY : 25

Subject   : *A comparative study of the Academic Achievement and attitude towards English subject of students of Std.-8th studying English from std.1 and from std.5th .*[44]

Researcher   : Dilip K. Raval, (Ph.D., Edu., Saurashtra University,2002)

Objectives   : To study out the levels of achievement of students of Std.8th and the sub-samples of independent variables.

To study out the levels of favorableness or unfavorableness, in respect of attitude towards English of the sub-samples of independent variables.

To study out the correlations between the attitude and the achievement scores of the students of std.8th and sub samples of independent variables.

To compare the correlations between the sub-samples of independent variables.

To establish the regression equations to predit the achievement for the sub-samples of independent variables.

Tools   : An attitude scale which was constructed by researcher himself as per Likert Method.

An achievement test for English which was made by researcher himself.

Sample   : The investigator selected 1176 students of Std.

		1 to 5 from Gandhinagar and Ahmedabad districts. The sample was selected by employing random stratified cluster sampling technique.
Research Method	:	Survey type research
Procedure	:	The obtained data were organized in tabular from and statistical analysis of the data was made by applying 't' test. Regression analysis technique was employed to formulate regression equations for the prediction of attitude and achievement.
Findings	:	

- In the case of gender significant difference was observed. The attitudes of boys were more favorable than girls towards English.
- In the case of area significant difference was observed. Urban area plays an important role in the formation of attitudes.
- A significant conclusion of the study is that the class from which the students study English has significant impact on the attitudes of the students towards English.
- The class from which the students take English has effect on the achievement of the students. Boys score higher than the girl on the achievement is more than the achievement of the students of rural area.

Summary of related Studies (Study 21-25)

In this section there are five studies. B.V. Vachharajni (1988) studied attitudes of high school students towards sex. Suwimom Pukprayoom (1984) studied parent's towards school programmes in

central Thailand. G.N. Chaudhari (2003) studied the Attitudes of Teachers, Parents and Educational Administrators towards introducing English from Grade I to IV of Primary Education. N. K. Patel (2012) studied Attitudes of standard 8th students towards Mathematics. D. K. Raval (2002) studied the academic achievement and attitude towards English of students of Std.8th studying English from 1 to 5.

Area and Sample :

These studies being associated with achievement and attitudes have a sample of school students from different areas. Vachharajani (1988) had grade high school students. Five hundred forty seven students of Std. X and XII of Guarati Medium Schools of Rajkot District (urban and rural areas) have been covered as sample experiments. Suwimom Pukprayoom (1984) had grade 1000 parents were selected as sample by purposive sampling method. G.N. Chaudhari (2003) had grade a stratified sample which was including 900 teachers, 450 parents and 150 Educational Administrators. N.K. Patel (2012) had grade sample of primary students which was including 661 students. D.K. Ravla (2002) had grade a sample of 1776 primary students from Std. 1 to 5.

Tools and Method:

The researchers have employed necessary tools for the studies most of the research tools and the variables are standardized, whereas in the study of attitudes some researchers have developed their own tools. Vachharajani(1988), Suwimom Pukprayoom (1984) G.N. Chaudhari (2003) N.K. Patel (2012) D.K. Raval (2002) developed their research tools themselves. Vachharajani (1988) made the instructional material on sex education, on adjustment neuroticism and attitude sex of high school students. Suwimom

Pukprayoom (1984) made an attitude scale as per Thurstone Method. G.N. Chaudhari (2003) constructed Attitude Scale as per Likert Method. N.K. Patel (2012) used a standardized foreign attitude scale and translated it in Gujarati. Raval (2002) developed an attitude scale as per Likert Method, also developed an achievement test for English subject.

Findings :

Vachharajni (1988) fond that the self instructional material on sex educational has no effect on the adjustment of boys and girls of Std.X and Std. XII of urban and rural area. Pukprayoom (1984) fond the status, education and occupation has influence upon the attitude of parents. Chaudhari (2003) fond the teachers qualification and the parents high qualification has significant effect on the attitude towards English. Patel (2012) fond student are having anxiety about mathematics exam. Raval (2002) fond the class from which the students take English has effect on the achievement of the students.

2.8   GENERAL CONSIDERATION :

Studies on Attitude :

The affective component of attitude has been emphasized greatly. The comprehensive review of studies on various aspects of attitude conducted outside India has been reported in the second Handbook of Research on Teaching by Khan and Weiss (Travers,1973). They have reported that self reporting, observational and projective techniques have been measuring and data collection devices.

Green(1954) has observed that, "the method of equal appearing intervals is the most widely used of the judgment methods."

Many self-reporting instruments have been developed to measure attitude towards teaching, education, school and course among teachers and students. The Minnesota Teacher Attitude Inventory (MTAI) (Cooket. al., 1951) and the Survey of study Habits and Attitudes have been extensively used in research on teachers and students attitude (Travers, 1973).

Khan and Weiss (1973) have reported, "the actual availability and documentation of psychometrically sound attitude scales is, however, far from satisfactory." The have listed the available instruments to measure attitude of teacher and students towards education, school, teacher, teaching and school courses and have classified them according to their categories like Thurston, Likert etc.

Several tools have been constructed in India to measure the attitude of teachers and students. Pareek and Rao (1974) have published a handbook of instruments which lists 124 instruments to measure attitudes towards various objects. Most of them are Likert type of scales; only two of them are inventories. Wherever reliability coefficients are reported they are of a very high order indicating a general patter of high reliability estimates of instruments on educational attitudes. A few other instrments developed in India are by Ahluwalia,Bhogle,Katti and Bannur, Deo,Mohan Poonambalam and Visesaran (Pareek and Rao, 1974). Although all these scales are called as attitude scales to measure attitudes towards teaching, the content and orientations differ from scale to scale.

Attitude and Other Variables :

Nevertheless, attitude is considered an important factor in teaching learning process. The teacher attitude is linked with student attitude which in turn, is associated with his achievement. Khan and

Weiss (1973) have reported that several studies have been conducted at the high school level which used scores on the survey of study Habits and Attitudes as predictors of academics performance. The studies by Holtzman and Brown (1955), Khan (1969) and Robers (1969) found significant correlation between score on attitudes and standardized achievement scores on some objects.

Loree (1971) has done a review of research on attitude. These include the attitude measurement and attitudes related to student achivement.

The report of the Beginning Teacher Evaluation Study (Fisher et al.,1978) which is the culmination of a multiyear research programme on teaching effectiveness answered the question whether teaching processes, academic learning time and student achievement are related to student attitudes. The authors have reported that, "the general association of achievement and attitude appeared to be basically orthogonal. Some factors contribute to increase achievement, other factors promote more positive attitudes.

2.9   JUSTIFICATION :

The related studies have given a guideline for this research to the researcher, yet it is acceptable that this study is unique.

Most of the past studies are concerned with the attitudes of subjects like English, Science, Psychology, Philosophy, Mathematics etc. very few studies take up statistics as variable. The studies reviewed here verify that statistics has been a very important subject for commerce students nowadays. The present study takes up statistics as a subject. This area of education and Psychology remains untouched so far. Most attempts are made to study attitudes of

different subjects. No single specific observable act has yet been found whose frequency or percentage of occurrence is invariably and significantly correlated, with students attitudes.

The studies have also provided an insight to the researcher regarding the tools available and the process of tool construction. There are some standardized scales for the measurement of attitudes towards different aspects, but there is no sample selected for the present study. Hence the investigation decided to investigate an area which was not probed into deeply with proper tools.

Attitudes towards different aspects have been studied by many researchers one finds researches in the field of attitudes towards teachers, teaching profession vocational education. Elementary education etc. variables like gender, type of school, area, socio-economic level etc. are taking into consideration. There wasn't any study in which variable like medium of learning is taking into consideration. This is the first study in which this variable is taking into consideration.

This is the first ever study about to know student's attitudes towards statistics.

The next chapter (Chapter-3) describes the research design and its bases in detail.

CHAPTER NO. : 2
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