CHAPTER-III
THE DESIGN

Introduction

The National Policy of 1968\(^1\) marked a significant step in the history of education in Post-Independence India. It aimed to promote national progress, a sense of common citizenship and culture and to strengthen national integration. It laid stress on the need for a radical reconstruction of the education system, to improve its quality at all stages and gave much greater attention to science and technology, the cultivation of moral values and a closer relation between education and the life of the people.

Since, the adoption of the 1986 policy, there had been considerable expansion in educational facilities all over the country at all levels. More than 90 per cent of the country's rural habitation, now had schooling facilities within a radius of one kilometer. There had been sizeable augmentation of facilities at other stages also.

In the school curricula, in addition to laying down a common scheme of studies for boys and girls, science and mathematics were incorporated as compulsory subjects and works experience assigned a place of importance.

Teacher performance was the most crucial input in the field of education. Whatever policies may be laid down in the ultimate analysis. These had to be interpreted and implemented by teachers, as much

through their personal example as through learning processes. Teacher selection and training, competence, motivation and the condition of work impinge directly on teacher's performance. The National Policy on Education, 1986 called for a substantial improvement in the condition of work and the quality of teacher's education².

The policy also emphasized the teachers' accountability to the pupils, their parents, community and to their own profession. The revised Policy Formulations reiterated without modification, the National Policy on Education, 1986 postulated on Teacher and Teacher Education. The Programme of Action (P.O.A.), 1986 spelt out the main aspects of the strategy for implementation of these postulates. The Programme of Action, 1986 prescriptions continued to be relevance and need to be acted upon with vigor and determination.

On the line of the Policies laid down in 1968, 1986 and 1992 teacher education was to be given high priority. In the mean time, selection of right type of teachers had been problem for qualitative improvement and quantitative expansion of high schools in Manipur state. A healthy professional attitudes and desirable teachers like qualities were essential for teachers not only in improving their knowledge and teaching competence. It was true that the success of secondary education did not depend either on the definition of aims, statement of objectives but a totality on the academic and professional preparation of teachers. The study of attitudes possessed by them had been considered very much important for their professional preparation. The attitudes, values and beliefs that the teacher possessed had its influence towards the students in

their moral upliftment and other aspects of life. The impact was laid not only to the students but also to the society as a whole.

A positive favourable attitude made the works easier, satisfying and professionally rewarding and a negative unfavourable attitude made the teaching task harden, more tedious and unpleasant. Besides a teachers attitudes not only affect his or her behaviour in the classroom but also influence the behaviour of his students. Moreover effective and productive learning on the part of the students could only be achieved by employing teachers with favourable attitudes or by shaping their attitude in the desired directions. It was therefore, required, to measure attitudes of prospective and practicing teachers towards teaching profession and its allied aspects.

Laying the above background the present study was designed with a logical and systematic plan. Because a research design constitutes the blueprint for the collection, measurement and analysis of data. It was “the plan structure and strategy of investigation conceived, so as to obtain answers, research questions, the plan was the overall scheme or programme of research”3. A research design was the programme that guides the investigator in the process of collecting, analyzing and interpreting observations4. It provides a systematic plan and procedures for the research to follow5.

A research design was the arrangement of conditions for collection and descriptive of data in a manner that aims to combine relevance to the

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research purpose with economy in procedure\textsuperscript{6}. In fact, the research design was the conceptual structure within which the research was conducted. Hence, a research design was a strategy specifying which approach would be used for gathering and analyzing the data.

In other words, a research design was the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure\textsuperscript{7}. In fact the research design was the conceptual structure within which research was conducted, it constituted the blue print for the collection, measurement and analysis of data. As such the design included an outline of what the researcher will do from writing, the hypothesis and its operational implications to the final of data\textsuperscript{8}.

Keeping in view the above stated research design decisions, the researcher considered the overall research design into three parts: (i) the sampling design which dealt with the methods of selecting items to be observed for the given study, (ii) the observational design which related to the condition under which the observations were to be made, (iii) the statistical design which concerned with the question of how the information and data gathered were to be analyzed and (iv) the operational design which dealt with the techniques by which the procedures specified in the sampling, statistical and observational design could be carried out\textsuperscript{9}.

\textsuperscript{7}Claire Selltiz and others, Research Methods in Social Sciences, 1962, p.50.
\textsuperscript{8}Kothari, C.R., "Research Methodology Methods and Techniques", 2006, p.31.
\textsuperscript{9}Ditto.
From above it could be stated that research design was a plan that specified the sources and types of information relevant to the research problem. And it was strategy specifying which approach could used for gathering and analyzing the data. Further, it also included the time and cost budget since most studies were done under these two constraints. In short, research design should contain: (a) a clear statement of the research problem, (b) procedures and techniques to be used for gathering information, (c) the population to be studied and (d) methods to be used in processing and analyzing data.

**Definition and Meaning**

Definition and meaning of certain terms which were to be employed in the present study were given below for the purpose of clarity and conveniences.

**Attitudes and Its Meaning**

The concept of attitude was first established as a central variable by Thomas and Znaiceki (1918). They regarded attitude as an internationalized counterpart of an external object, representing the individual’s subjective tendencies to act towards that object. In human behaviour, attitude acts as dynamic forces. They gave direction to behaviour and influence the mental set up of the individual in any direction. Attitude were not necessarily, constant. They varied with the intensity of individual’s interest or situations involved. Attitude had meant as readiness to react towards or against some situation persons or things in a particular manner.
The term ‘Attitude’ had been derived from the Latin word ‘aptus’ which meant ‘fitness’ or ‘adoptedness’. Attitude could not be neuropsychic state of readiness for mental and physical activity. It was a disposition in which a person had to favour or not to favour a type or social object or social action. From psychological point of view, an attitude involved beliefs as well as feelings and certain characteristics that distinguished attitude from interest.

Various definitions on the term “Attitude” had been given by experts in the field of education, psychology and philosophy. Amongst other definitions, few had been selected for purpose of easy reference.

A few definitions given by psychological experts like, Crow and Crow, Guilford, Miller, Thorndike, Morse etcetera, were referred in the present study.

The meaning of the word ‘attitude’ defined by Collin in the ‘Keywords in Education’ was that it was “an organismic state of readiness to act that is often accompanied by considerable affect and that may be activated by an appropriate stimulus into significant or meaningful behaviour. Attitude is also a persistent disposition to act either positively or negatively towards or person, group, object, situation or value”\(^\text{10}\).

According to Crow and Crow in his “Educational Psychology” the word attitude had been defined as, “attitude, the affective by-product of an individual’s experience, have their bases in his inner urges, acquired habits, and the environment influences by which he is surrounded. In

\(^{10}\)Collins., K.T., “Key words in Education” 1973, p.19.
other words, attitudes result from personal desires and group stimulation. They actually are a part of an individual’s own personally but are affected by the attitudes and behavior of the group or groups with which he associates. Attitude can exert a potent influence upon an individual. They act as causes as well as results of behavior. They are personal and are associated with the feeling tones connected with the individual’s experiences. They represent the way he feels as he thinks, talks, or acts in any situation”\textsuperscript{11}.

On the other hand, ‘attitude’ according to Guilford in his book ‘General Psychology’, had been defined as “our attitude toward other and other people are very complex dispositions to accept or to reject. We are favorable or unfavorable towards a person, an institution, a proposal, or a social issue. The positive or negative tendency is apparent in every attitude. We are for or against something. In general sense, mere preference based upon pleasantness or unpleasantness, an esthetic judgment or the expression of an interest, all may be called attitudes”\textsuperscript{12}.

According to Miller in his ‘Methods and Materials for Teaching Biological Sciences’, “an attitude is a condition of mind involving imagination and emotional state which are result of previous experiences. Attitude condition behaviour, establishing patterns of conduct and attitudes are ethics”\textsuperscript{13}.

The word ‘Attitude’ according to Thorndike, it had been defined as “a feeling of favourableness or unfavourableness towards some group, institution, or towards proposition”\(^14\).

According to Morse, in his ‘Psychology and Teaching’, “attitude are emotionally toned ideas directed towards or against something. For attitudinal learning to take place, feeling must be aroused during the learning. This seem obvious but is ignored by teachers who think children will learn respect for the flag by repeating the pledge of allegiance every morning or develop a favourable attitude towards cleanliness by going through a health inspection everyday. Te appropriate emotion must be aroused during the experience on the desired learning will not take place”\(^15\).

Apart from the above definitions, dictionary meanings given by the different dictionaries were also considered in the present study.

According to ‘Encyclopedic Dictionary of Psychology and Education’, the word “attitude” was defined as “a learned predisposition to act in a constant way towards particular persons, objects or conditions. Educational institutions seek to encourage in students those attitudes that would give them the desire to learn”\(^16\).

According to the ‘Dictionary of Psychology’ the word ‘attitude’ was meant “as a relatively stable and enduring predisposition to behave or react in a certain way toward persons, objects, institutions or issues, looked at from or slightly different point of view, attitudes are tendencies


to respond to people, institutions or events either positively or negatively. The source of attitude were cultural, familial and personal. That was tended to assume the attitudes that prevail in the culture in which we grew up\textsuperscript{17}.

And according to the 'International Dictionary of Science Language of Webster, the word 'attitude' had been interpreted as a "personally disposition affecting conduct and belief in relation to some person, institution, situation or other object, revealing itself, for example in love or hate in degrees of intensity from person to person\textsuperscript{18}.

Further, according to another 'Dictionary of Behavioural Sciences', the word 'attitude' has been defined as "a learned predisposition to react consistently in a given manner either positively or negatively to certain persons, objects or concepts. Attitudes have cognitive, affective and behavioral components\textsuperscript{19}.

**Problem**

According to the 'Dictionary of Psychology' the word 'Problem' has been defined as "a mathematical statement requirement the solution of an unknown\textsuperscript{20}.

And meaning, according to the 'Oxford Dictionary of English Etymology' the word 'Problem' has been defined as" a difficult problem,

\textsuperscript{17}Atkinson, J., Bern, E, "Dictionary of Psychology", fourth edition, 1988, p.41.


\textsuperscript{19}"Dictionary of Behavioural Science", Compiled and edited by Benjamin, B.W.,1975, p.34.

question proposed for discussion, matter of inquiry, proposition in which something is required to be done"\textsuperscript{21}.

According to Websters' Third New International Dictionary 'Problem' has been defined as "an unsettled matter demanding solution or decision and requiring unusually considerable thought or skill for its proper solution or decision. Problem has become something that was a source of uses, considerable difficulty, perplexity or worry, something that presented or perplexing or vexing problem, or course of trouble or distress"\textsuperscript{22}.

In the present study the term 'attitude' would be studied as the 'Attitude' of the graduate science teachers in delivering his duties in the classroom and the institutional management. And the term 'Problems' in the present study would mean as after effects resulted created from the job satisfaction, transfer policy, infrastructural positions, placement according to merits and seniority, promotional matters, relationship with the institutional management and administration, etcetera. It would also involved the policies and drafting and framing of syllabus, availability of text books, before the starting of the session etcetera. The impact of all these factors affecting the attitude of the teachers, would be implied in the present study.

**Meaning of Science**

According to Webster's New International Dictionary of Seven Languages' meant passion of knowledge as distinguished from ignorance or misunderstanding; knowledge as personal attribute; knowledge posses


\textsuperscript{22} Webster’s 3\textsuperscript{rd} New International Dictionary, vol.II, p.1807.
or attain through study or practice; a branch or department of systematized knowledge that is or can be made or specific object of study; something that may be studied or learned like systematize knowledge; trained skill; studies mainly in the works of ancient and modern philosophers formerly taught as a group or field of specialization; any of the individual subjects taught as an educational institution in one of the department of Natural Science; accumulated and occupied knowledge that had been systematized and formulated of general law; knowledge classified and made available, work, life or the search for truth; comprehension, profound, philosophical knowledge specially knowledge, obtained and tested through the use of the scientific method; such knowledge concern with physical world and its phenomena; Natural Science; a branch of study that is concern with observation classification with fact specially with establishment or strictly with the quantitative formulation of verifiable general law chiefly by induction and hypothesis; a system based or purporting to be based upon scientific principle; a method or reconciling practical or utilitarian ends with scientific laws.  

Graduate:

According to Websters' Third New International Dictionary Unabridged and Seven Language Dictionary, the word 'graduate' meant (a) one that has received an academic degree, a diploma or a certificate; a graduate student; one who has qualified in a particular field or for a particular position; one who has passed through a significant or unusual and especially powerful experience often associated with an institution; (b) holding an academic or profound degree, diploma, or certificate; of

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relating to or engaged in studies that go beyond the first or bachelors' degree and are usually, specialized or professional; arranged by degree; (c) to grant an academic or professional degree, diploma, or certificate to; dismiss with such a degree, diploma or certificate to; dismiss with such a degree, diploma or certificate; to grant the right to go or concede the completion of the qualification for going; to move up to the next school grade; to qualify an proficient or learned; to mark with degrees; to divide into or arranged in regular or proportional steps, grades, graduations or intervals; to concentrate; to received from university, college, or school an academic college, or an academic degree, a diploma or a certificate denoting fulfillment of requirement leading to it.  

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**Teacher**

The meaning of the word 'teacher' according to Websters' Third New International Dictionary Unabridged and Seven Language Dictionary, has been defined as one that teaches or instructs; one whose occupation is to instruct; a religious instructor or preacher often not regularly ordained in a congregational church, a member of the Aaronic priesthood of the Mormon church of the grade between deacon and priest.  

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**High School**

The meaning of the 'high school' according to Websters' Third New International Dictionary, was meant as a secondary school usually

\[\text{Reference: Websters' third New International Dictionary Unabridged and Seven Language Dictionary, vol., p. 985} \]

\[\text{Ibid, vol. III., p. 2346} \]
public supported and usually organized on a three year or four year basis and comprising seven divisions and a college preparatory school.\textsuperscript{26}

According to the Compact Edition of the English Dictionary, the word 'high school' meant that a designation applied (with some variety of use) to certain classes of school for secondary education in the British Island and the United States.\textsuperscript{27}

**Method of Approach**

The present study would apply descriptive field survey research method, as the investigator felt it necessary to what the materials from the teachers of different schools of varied categories. To design a methodology for any research work became an unavoidable need because "a research was the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedures"\textsuperscript{28}.

In fact the research design was the conceptual structure within which research was conducted. It constituted the blueprint for collection, measurement and analysis of data. As such the design included an outline of what the researcher would do from writing the hypothesis and its operational implications to the final analysis of data\textsuperscript{29}.

Methods of approach in the present study would be descriptive and field survey. This was done considering the merits and applicability of its approach. For, descriptive research method were designed to obtain

\textsuperscript{26} Ibid, vol. II. p. 106.
\textsuperscript{28} Kothari, C.R., "Research Methodology Methods and Techniques" 2006, p.31.
\textsuperscript{29} Ibid. p. 31.
pertinent and precise information concerning the current status of phenomena and wherever possible, to draw valid general conclusion from the facts discovered. They were also restricted, not only fact finding but may often result in the formulation of important principles of knowledge and solution of significant problems, concerning local, state, national and international issues. It helped to explain the educational phenomena in terms of conditions or relationship that existed opinions that one hold by students, teachers, parents, experts, processes that has been going on.\footnote{Kouf, L., “Methodology of Educational Research”, Third Edition, 2001, p. 432.}

"Descriptive research uses quantitative methods to describe what is describing, recording, analyzing and interpreting condition that exist. It involves some type of comparison or contrast and attempts to discover relationships between existing non manipulated variables. Some forms of statistical analysis is used to described the results of the study. And qualitative descriptive research uses non quantitative methods to describe what is qualitative descriptive research uses systematic procedures to discover non quantifiable relationship between existing variables" \footnote{Best, J.W., “Research in Education”, Prentice Hall of India, Pvt. Limited, N.Delhi, 2006,p.22.}.

The descriptive investigations were of immense value in solving problems about the children school organization, supervision, administration, curriculum, teaching method and evaluation. Survey studies were conducted to collect the detailed description or existing phenomena with the interest of employing data to justify the current conditions and practices or to make more intelligent plans for improving them.
In any research work the method of selections of items to be observed for the given study need to be dealt with. Further, the observational design which related to the condition under which the observational were to be made. Again, the statistical design which concerned with the question of how many items were to be observed and how the information and data gathered were to be analyzed. And, the operational design which dealt with the sampling, statistical and observational design could be carried out.\(^\text{32}\)

It was a plan that specified the sources and types of information relevant to the research problem. It was a strategy specifying which approach could be used for gathering and analyzing the data. Further, it also included the time and cost budget since most studies were done under these two constraints. In short, while carrying out the present investigation, a clear statement of the research problem; procedures and techniques to be used for gathering information; the population to be studied and methods to be used in processing and analyzing data had been specified.

It was that method of investigation which attempted to describe and interpreted what existed at present in the form of conditions, practices, processes, trends, effects, attitudes, beliefs etcetera. And, it was concerned with the phenomena that were typical of the normal conditions. It investigated into the conditions or relationships that existed practices that prevail beliefs, points of view or attitudes that were held, processes that were going on, influences that were being felt and trends that were developing. It was an organized attempt to analyze, interpret

\(^{32}\) Ditto..
and report the present status of a social institution, group or area. It sought to answer the questions.

Descriptive survey research dealt with the relationship between variables, the testing of hypothesis, and the development of generalization, principles, or theories that had universal validity. This research was sometimes divided into correlational research, causal comparative research and other descriptive research that was neither correlational nor design to find causation but described existing conditions. All of these types of descriptive research were having the same basic components, because they were all attempting to find generalizable attributes and they all dealt with present conditions.

It also involved events that had already taken place and might be related to a present condition. This method was particularly appropriate in the behavioral sciences because many of the types of behaviour that interest researcher could not arranged in a realistic setting. Moreover, Introducing significant variable could be harmful or threatening to human subjects. Ethical considerations often precluded exposing human subjects to harmful manipulation.33

It had the following characteristics which distinguished them from other types of researches: They involved hypothesis formulation and testing and they used the logical method of inductive deductive reasoning to arrive at generalizations. It often employed methods of randomization so that error might be estimated when population characteristics were inferred from observation of samples. And the variables and procedures

were describe as accurately and completely as possible so that the study could be replicated by other researcher.

These characteristics made descriptive research similar to other kinds of research, however these methods were non experimental because they dealt with the relationship among none manipulated variables. Because the events or conditions had already occurred, the researcher merely selected the relevant variables for an analysis of their relationship. It also sought to find answer to questions through the analysis of variable relationship. And it was often impracticable or unethical to arrange occurrences, an analysis of past events or of already existing conditions might be only feasible way to study causation. Such type of research was usually referred to as ex post facto or causal comparative research or when correlational analysis were used as, correlational research.

As such, the investigation had collected materials through questionnaire schedule from 400 teachers representing 400 schools. The schools were categorized into Primary, Middle, Junior High School, Upper Junior Basic School, High School and Higher Secondary Schools.

The 400 teachers were from the four valley districts of Manipur. The four valley districts as stated, were Imphal East, Imphal West, Bishnupur and Thoubal. Each of these districts had its own zonal divisions representing Zone I to Zone IV. This was done for administration purpose in the field of education.

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34 Ibid., p.129.
Sampling

Before taking up the definition of the sampling by the researcher, it was necessary to define the some fundamental terms which were associated to the sampling processes.

The word ‘sampling’ could be defined as the selection of some part of an aggregate or totality on the basis of which a judgment or influences about the aggregate or totality was made. In other words, It was the process of obtaining information about an entire population by examining only a part of it\textsuperscript{35}.

Another definition of ‘sampling’ could be defined as the process by which a relatively small number of individuals, objects, or events was selected and analyzed in order to find out something about the entire population from which it was selected\textsuperscript{36}.

Population

The word ‘population’ in the field of educational research, could be defined as ‘any group of individuals who had one or more characteristics in common that were of interest to the investigator. And population might be all the individuals of a particular type or a more restricted part of that group\textsuperscript{37}. As such the researcher had considered all the science graduate teachers who were working in the valley district of Manipur, in the different 1455 institutions, as a population for the research purpose.

\textsuperscript{35} Kothari, C.R. “Research Methodology, Methods and Techniques”, 2006, p.152.
Size

The word ‘sample’ could also be defined as a small proportion of a population, selected for observation and analysis. By observing the characteristics of the sample, the investigator could make certain influences about the characteristics of a population from which it was drawn\(^ {38}\).

Therefore, the investigator, had chosen 400 Science graduate teachers out of 855 science teachers from the four valley districts of Manipur, as a sample for the research study in a systematically random way, so that chance or the operation of probability could be utilized.

In short, the primary purpose of the research was to discover principles that had universal application, but to study a whole population to arrive at generalisation, would be impracticable. Moreover, some population were so large that their characteristics could not measured and before the measurement could be completed, the populations would have changed\(^ {39}\).

And for studying the entire population of science graduate teachers of four valley districts of Manipur, would require the services of thousands of researchers, huge amount of expenditure and hundred of thousands of class hours. Fortunately, the process of sampling made it possible to draw valid inferences or generalisations on the basis of careful observation of variables within a relatively small proportion of the population.

\(^ {38}\) Ditto.
\(^ {39}\) Ibid, p.12
Therefore, sampling technique was used in the present study for the following purposes:

1. Sampling could save time and money. A sample study was usually less expensive than a census study and produce at a relatively faster speed.

2. Sampling could enable more accurate measurement for a sample study was generally conducted by trained and experienced investigators.

3. Sampling remained the only way when population contains infinitely many members.

4. Sampling remained the only choice when a test involves the destruction on the item under study.

5. Sampling usually enable to estimate the sampling errors and then assisted in obtaining information concerning some characteristics of the population.

Tools

The tools employed for the collection of data were Questionnaire Schedules and Information Sheet on the Attitude and problems of the Science Graduate Teachers in the schools. The Questionnaire Schedule were administered to 400 Science Graduate Teachers of the different schools under study and interviewed them respectively. The responses were grouped for each item. The item wise responses were arranged in such a that it could measured, compared, analyzed and interpreted under
a five point scale. The investigator utilized the five point scale developed by S.P. Ahluwalia basing on Likert's rating scale.

It contained multiple items and contained 90 statements. The scale was constructed in such a way that an analysis of its statistical properties and their significant might help to prove the presence of favourable attitude of Science Graduate Teachers of valley districts of Manipur state. The present opinion attitude scale was a series of statement dealing with six aspects attitudes towards; (i) Teaching profession, (ii) Classroom teaching, (iii) Child centered practices, (iv) Educational process, (v) Pupil and (vi) Teachers.

The subjects were asked to respond to each item by agreeing or disagreeing ranging from SA (strongly agree) to SD (strongly disagree) and his/her responses were converted into scores in such a way that as high score indicated a great amount of what was being measured attitude and a low score of the less amount. Thus the favourable and unfavourable continuum adequately measured the aforesaid six selected areas.

The inventory was constructed and standardized by S.P. Ahluwalia, All 90 statements were administered to 50 science graduate teachers of D.M. College of Teacher Education, Imphal as a try out sample. From the study, only 50 items had been selected for the final administration to the subject considering their time constraint and busy schedules.

The investigator distributed the Attitude questionnaire schedule to the subject enclosing a instruction sheet, regarding the nature of responding by putting (√) tick mark in the space provided. Keeping the rationale of attitude scale, in mind, 50 psychometrically good or
favourable attitude statement were selected to constitute the final form of Teacher Attitude Inventory (TAI). Out of 50 items 31 items were in positive declarative form and rest 19 were in negative form. Thus, the favourable and unfavourable continuum adequately measured the aforesaid six selected areas.

**Scoring**

Each item alternative was assigned a weight range from 5 (strongly agree-SA) to 1 (strongly disagree-SD) for favourable items. In the case of unfavourable items range of weights was reversed that was, from 1 (strongly agree-SA) to 5 (strongly disagree- SD). The attitude score of a subject was the sum total scores of all the six sub scales.

**Reliability**

Reliability of the inventory was estimated by split half (old-even) method and found to be .79 (corrected to .88) for a sample of 239 prospective teachers. The test-retest reliability coefficient found to be .59 (N=102) and .64 (N=290).

**Validity**

The inventory appeared to have content validity and the method of selecting items supports this supposition.

1. Before administration of the tool (Questionnaire Scheduled and Information Sheet) Science Graduate Teachers of the four valley districts, Head of the institution were contacted personally and their teachers were requested to serve as the subject of the study. Then some individual teachers were also contacted for the same.
The researcher made sincere effort to get the true responses from the subjects who were contacted personally and requested to give positive help and cooperation. All the guidance and instructions to be followed during the test were given. In the meanwhile, investigator tried to motivate the respondents by promising to send a separate abstract of the conclusion of the investigation to each of them. And, it was assumed and promised to them their responses would be kept confidential and would not be used for any other purpose except for the present investigation so that they could give honest responses without any fear. Then, one copy of the Questionnaire Scheduled, Information Sheet, along with an answer sheet was given to each of them and instructed them to answer all the 100 questions.

**RATIONALE OF THE ITEMS**

1. The Teacher Attitude Inventory (TAI) developed by S.P. Ahluwalia consisted of 90 statements. Out of these, 50 statement, the present scale contained both negative and positive attitude items. And agreement with the positive items and disagreement with the negative ones, indicated positive attitude while agreement with the negative items and disagreements with the positive ones were expression of negative attitudes.

2. Corollary of condition and response or reaction as well as cause and effect or result was followed in the formulation of the statement.

3. The principles were adopted as an attempt to evade the problem of acquiescence response set and to invite mindful exercise of the respondents.
(4) Attitudes’ Questionnaire Scheduled were scaled carefully oriented and groomed to basic concept in human personality structure.

(5) This was specially planned and carefully arranged to meet the common interest and attitude of Science Graduate Teachers.

(6) This involvement was objectively scorable. In addition to that this also gave complete coverage of attitudes of the subject which could be measured during the short span of time.

(7) It had been credited with high degree of validity, reliability and objectivity.

(8) The Questionnaire Scheduled and Information Sheet were meant for the literates Graduate Science Teachers.

This tool had reasonably high reliability and validity. As such, it was a quite adequate scale for measuring attitude towards teaching professions, classroom teaching, child centered practices, educational processes, attitude towards pupils and teachers. This inventory was easy to administer and score. Its wide usage was reasonably long and had appreciably high reliability and validity. It appeared to be useful for conducting research in the following areas:

(1) Measuring the effectiveness, mainly in the area of attitude development of teachers’ preparation, education programme in India.

(2) Knowing whether student teachers had acquired the desired attitude.

(3) Assessing the quality in respect of attitude development of secondary teacher training college programme.
Comparing the performance of different training institutions in the area of attitude development.

Comparing the attitudes of different groups of prospective and practicing teachers, on the six selected sub areas of teaching profession/process.

Using as a tool for conducting interdisciplinary cross-cultured and transactional research in the field of attitude of prospective and practicing teachers and

Constructing newer and more dependable tools in the difficult area of attitude appraised and assessment.

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RESPONSE MODE

Likert continuum strongly agree, agree, undecided, disagree and strongly disagree had been provided for each item. The subject responded to each item by putting a tick (✓) in the square of the chosen alternative against the serial number of the attitude statement in the answer sheet. Subjects were requested to respond to all the items. They did not have the option to leave any item unanswered. The subjects were not permitted to make any mark on the test booklets as they are reusable. To make scoring easy and less time consuming a set of scoring keys had been prepared.

Objectives of the Study

The objectives of the present study were as given below:

1. To study the Attitudes of the Science Graduate Teachers of the different schools of the four valley districts of Manipur.

2. To study the Problems of Science Graduate Teachers teaching at the different schools of valley districts of Manipur.

To make a comparative study on the attitude of science graduate teachers of the schools of the four valley districts classifying it into:

1. Male and Female
2. Rural and Urban
3. Below 10 years teaching experience Vs above 10 years teaching experience.
4. High qualified (M.Sc.Trained Teacher) Vs Lower qualified (B.Sc.Trained Teacher) in respect of problems and attitudes of the Science Graduate Teachers of the valley districts of Manipur.
5. Imphal East Science teachers Vs Imphal West Science Teachers.

7. Science Teachers of Imphal East Vs Thoubal District; Imphal East Vs Bishnupur District; Imphal West Vs Thoubal District

Hypothesis of the Study

The hypothesis developed for the present study were:

There exists significance difference between male and female; rural and urban; above 10 years teaching experience versus less than 10 years teaching experiences; highly qualified (M.Sc., Ph.D., M.Phil., Trained Teacher) versus lower qualified (B.Sc. Trained Teacher) in relation to problems and attitudes of the Science Graduate Teachers in the schools of four valley districts of Manipur.

Delimitations of the Study

1. The present study had taken up only 400 (four hundred) Science Graduate Teachers of four valley districts of Manipur, as sample for the study.

2. The study had covered the Science Graduate Teachers who were working in the Primary schools, Junior Basic Schools, Junior high schools, High and Higher secondary schools of Government, Aided, Unaided and Autonomous institutions, in the valley districts of Manipur.

3. The study would not cover Science Graduate Teachers working in the hill areas of Manipur.