CHAPTER III

REVIEW OF RELATED STUDIES

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CHAPTER III

REVIEW OF RELATED STUDIES

•3.1 INTRODUCTION

In any research work the first task of the investigator is to look into the past work done in the area in which he proposes to take the research. The review of related studies implies locating, reading and evaluating report of research as well as the reports of casual observation and opinion that are related to the individual's planned research project.

The review of the related study is nothing but a wide look into the past research works done in the specified fields. It provides information related to the type of study and type of design that may be eventually used in conducting research. Research works done in the past serve as solid foundation on which any new investigation firmly rests.
Walter emphasizes the meaning of related literature as: "The literature in any field forms the foundation upon which all future work will be built."

The author further observes that if one fails to build this foundation of knowledge provided by the review of the literature, his work is likely to be shallow and naive, and will often duplicate work that has already been done better by someone else.

Good, Bar and Scates point out:

"The keys to the vast storehouse of published literature may open doors to sources of significant problems and explanatory hypotheses, and provide helpful orientation for definitions and comparative data for interpretation of results. In order to be truly creative and original, one must read extensively and critically as a stimulus to think."


3.1 **PURPOSES OF THE REVIEW**

Every investigator must know what sources are available in the field of research and how many of them are worthy to be used. As in other fields, in the field of education also, the research worker needs up-to-date information regarding the problem, i.e., what has been thought and done in the particular area.

Good, Bar and Scates analyse the purpose of research review as follows:

(a) To show whether the evidence already available solves the problem adequately without further investigation and thus to avoid the risk of duplication.

(b) To provide ideas, theories, explanations or hypotheses valuable in formulating the problem.

(c) To suggest methods of research appropriate to the problem.

(d) To locate data useful in the interpretation of result.

To contribute to the general scholarship of the investigator.

When the investigator makes a careful review of the related studies, he becomes aware of the important and unimportant variables in the concerned area of research. A careful review also helps the investigator in selecting the variables lying within the scope of his interest, in defining and operationalising variables and identifying variables which are conceptually and practically important. Thus, a review of the related studies, on the whole, prepare the investigator to formulate a research problem in which conceptually and practically important variables are selected.

3.2 IMPORTANCE OF THE REVIEW

A review of the related studies helps the investigator or in avoiding any duplication of work done earlier. A careful review always aims at interpreting prior studies and indicating their usefulness for the study to be undertaken. Thus prior studies serve as the foundation for the present study. In some cases duplication or replication of prior studies
becomes essential. This is specially true when the investigator wants to test the validity of the earlier studies. In such a situation, too, a careful review helps the investigator in getting acquainted with the number and nature of the studies related to the study whose validity is being assessed at present.

A careful review of the related studies enables the investigator to collect and synthesise prior studies related to the present study. This, in turn, helps the investigator in building a better perspective for future research. A synthesised collection of prior studies also helps the investigator to identify the significant overlaps and gaps among the prior works.

A review enables the investigator in discovering important variables relevant to the area of the present study. When significant variables are discovered, the relationship among them can be indentified. Subsequently, the identified relationship is incorporated into different hypotheses. Thus, for conducting a scientific study, the relationship between the different variables must be explored by reviewing the
related studies so that a good context may be built up for subsequent investigation.

A careful consideration of 'recommendations for further research' in various research studies guides the investigator regarding the suitability of the problem and assists in delimiting his research problem. Therefore, the investigator has tried to review the literature of the post studies which correlates with achievement and creativity to benefit himself in the abovementioned ways.

The review of the related studies is divided into two parts:

(i) Research studies in India, and
(ii) Research studies in other countries.

3.3 RESEARCH STUDIES IN INDIA

The review of the research studies done in India is noted hereafter.
3.3.1 Effect of Creative Teaching on Creative Thinking of Adolescents

Sample:

An ordinary private school was the venue of the experiment, as there were only 12 students in class IX, continuous and intensive interaction was possible between teacher and the taught. So the sample was keeping the possibility of personal relationship and in depth interaction in a small classroom which was natural after establishing rapport.

Tool:

The Mehdi's verbal and non verbal test of creative thinking was administered.

Procedure:

The 17 lessons in Biology were taken involving the pupils according to the lesson plans without disturbing the class timetable. After a month post-test was conducted using

Findings:
The pre-test and post-test raw scores of 12 pupils for verbal fluency, verbal flexibility, verbal originality and verbal elaboration and non-verbal originality were found to be high and 't' value were significant at 0.01 level. Hence null Hypotheses relating to verbal creative thinking of pupils and non-verbal creative thinking were rejected.

3.3.2 Impact of Creative Methods of Teaching on the Attainment of Higher objectives in Science.

Objective:
To find out whether creative methods of teaching physics and chemistry were superior to the traditional methods in attaining higher objectives.

Sample:
The parallel group experimental design was used. The study was carried out in six secondary schools selected on

the basis of stratified random sampling from North Parur and Kodungallur educational sub.districts of Kerala.

Procedure:

The experimental and the control groups were equated on the basis of age, sex, socio-economic status, intelligence and school achievement. The experimental group was taught through creative methods and the control group was taught through traditional methods.

Tools:

Standard progressive matrices, Socio-Economic status Scale of Kuppuswamy, Opinionnaire and Achievement Test were the major tools which were used for collecting data.

Findings:

The major findings of the study were:

(i) The creative methods were superior to the traditional methods like verbal illustration and demonstration in attaining higher objectives in science.
(ii) The creative methods were superior to the traditional methods for the sub-samples (Sex, Management of Schools and Locality of Schools)

(iii) The creative methods were superior to the traditional methods in the attainment of higher objectives in the case of pupils having different levels of intelligence and socio-economic status.

3.3.3 An Experimental Investigation of the Effect of Selected Teaching Strategies on the Development of Creative Thinking and Achievement in Science. 6

**Objectives:**

The objectives of the study were:

(i) To find out the effectiveness of the strategies St₁, St₂, St₃ and St₄ on the development of creative thinking ability of standard VII pupils.

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(ii) To find out the effectiveness of the strategies $St_1$, $St_2$, $St_3$ and $St_4$ on the achievement of standard VII pupils in Science.

**Tools:**

I.Q. Test, Creative Thinking Test, Figural and Pre-achievement Test were administered.

Various statistical techniques like means, S.D.S., correlations and analysis of variance were applied.

**Findings:**

The major findings of the study are stated as under:

(i) The difference between the selected strategies for their effectiveness in developing creative thinking and achievement in science of seventh class pupils is significant at 0.01 level of significance.

(ii) It was found that the four strategies of teaching had significantly differential effects on the development of originality and flexibility but the F ratio for the effect of strategies was found to be not significant in the case of fluency.
(iii) The St₄ produced significantly high mean scores for achievement of the pupils than all other strategies. St₃ and St₂ produced significantly higher means scores than St₁ and there was no evidence of significant difference between St₃ and St₂.

(iv) The St₄ was more effective in developing creative thinking and its components as compared to all other strategies.

(v) It is observed that the effects of strategies were dependent upon the level of intelligence, sex and creativeness of pupils.

(vi) St₃ i.e. dominancy of practical work did not show any significant superiority over lecture with respect to low intelligence and low creativeness girls.

3.3.4 An Investigation into the Effectiveness of Purdue Creative Thinking Programme on the Creative Ability of Elementary School children.⁷

The Purdue Creative Thinking Programmes consists of thirty two programmes focusing on the life of great people and on events in American history. Out of these, the investigator translated eighteen programmes into Gujarati with necessary modifications. He then developed other similar programmes based on Indian history. The series of twenty five international people and events relates very closely to school curriculum. Each programme consists of one creative activity worksheet. It also contains three or four similar exercises.

Objectives:

The objectives of the study were:

(i) To develop the creative thinking programme in Indian culture.

(ii) To study the effect of the programme on the creativity of the children.

(iii) To study the effect of the programme in relation to I.Q. of the students.
Sample:

A total of 315 fifth grade students from eight classes of Four Schools at three talukas of Kheda district, participated in the study. Out of eight classes, four classes were treated as experimental classes and four classes were treated as controlled classes.

Procedure:

The Creative Ability Test developed as a part of this programme was administered to all students of eight classes with a view to framing equal groups. Then the Creative Thinking Programme was implemented in the experimental group followed by discussion, once a week. For first three weeks and then twice a week for the rest eleven weeks. The Creative Ability Test was again administered as a post test to all students under study. The General Ability Test prepared by J.Z. Patel was administered to obtain I.Q. of each pupil.

Findings:

The major findings of the study were:

(i) The main effect of treatment - the training of creativity by creative thinking programme was
significant for the creativity and its own component measures : Fluency and Originality.

(ii) The main effect of I.Q. was significant but that of sex was not significant.

Thus, it could be said that creativity training could be profitably imported to the children in the developing countries like India.

3.3.5 A Study of the Effectiveness of Verbal Creativity Instructional Materials in School Stage.

The study was undertaken on the pupils of Std. VI of 15 schools of Bangalore district.

**Hypotheses:**

The single group pre-test design and post-test design was selected to test the following hypotheses.

(i) There will be no significant difference in the

effect of verbal creativity instructional materials on the students of different creative potential.

(ii) There will be no significant difference in the effect of verbal creativity instructional materials on the students of different socio-economic status.

**Tools:**

Passi test of Creativity comprises six tests, 3 verbal, 2 non-verbal and 1 with non-verbal stimuli but verbal responses. Four of the tests, 3 verbal tests and 1 with non-verbal stimuli with verbal responses were selected as the instructional materials that would be developed only in verbal form. The four tests viz., seeing problem test, unusual uses test, consequences test and test of inquisitiveness were translated into local language Kannada. As the pupils of Std. VI would not be fluent, and fast in writing, the time per test was increased by 1.5 times. The test with increased time duration were administered by the investigator in all the schools.

The pupils of all the schools were provided the cyclostyled copies of verbal creativity instructional
The investigator read the first half of the story and motivated the pupils. The children had to solve the puzzles, riddles etc., only after they solved all the puzzles, the second half was read to them. Before and after administration of these instructional materials Passi Test of Creativity were administered as pre-test and post-test. Then they were given a creative rating scale.

**Findings:**

The findings of the study were:

(i) The null hypothesis was rejected in case of middle and low level of creative potential groups.

(ii) The null hypothesis was not rejected in case of high creative potential groups.

3.3.6 Creativity as Related to Intelligence, Academic Achievement and Security - Insecurity.

Objectives:

The objective of the study were:

(i) To investigate uniformities existing in relationship among creativity, intelligence and academic achievement.

(ii) To find out as to what extent creativity was related to the feeling of security-insecurity.

Sample:

The study conducted on two samples. The first sample consisted of 400 high school students of Std.X categorising into 200 boys and 200 girls. The sample was chosen from four boys' schools and four girls' schools respectively by the random sampling technique. The age group of the boys and girls ranged from fourteen to seventeen years. On this sample the relationship among creativity, intelligence and academic achievement was studied.

The data for studying the relationship between creativity and security-insecurity were collected from the sample of 200 high school boys which were selected for the
first study. Their age also ranges from fourteen to seventeen years. The average age was 15.2 years.

**Tools:**

The investigator used the following tools for the study.


(ii) Creativity test designed by N.S. Chauhan and G. Tiwari and adopted by Basu in Bengali.

(iii) The records of Annual Examination.

(iv) Security-insecurity inventory developed by G. Tiwari adopted by Basu in Bengali.

**Procedure:**

Standard progressive Matrices prepared by J.G. Raven (1958) were administered to all subjects individuals with proper instructions to find out the intelligence level of the sample. Creative test was also given individually following proper instructions there of. The different parts of the tests in the given time were asked to complete it. The
academic performance scores of the annual examination for all the subjects selected for the first study were collected from the school records.

The high and low creative groups were found out by the creativity tests which were administered on the 200 high school boys of first sample. The high group was estimated to be of 50 and the low group was also estimated to be of 50. Security-insecurity was then applied to both the groups separately allowing twenty minutes for each subject of the two groups to perform their tasks as this test required twenty minutes as time limit.

Findings:

The major findings of study were:

(i) The scores on intelligence test and test for creativity used were highly correlated.

(ii) The findings of the present study taken as its face value indicated that academic performance of secondary students could effectively be predicted on the basis of intelligence as well as creativity measures.
(iii) The two groups were significantly different from each other with regard to their performance on security-insecurity inventory.

3.3.7 A Study of the Effect of a Specially Designed Teaching Strategy and some Socio-Psychological Factors on Creativity among Middle School Children

Objectives:

The objectives for the study were:

(i) To find out the effect of the specially designed teaching strategy on general creative abilities of urban and rural children.

(ii) To investigate the effect of the specially designed teaching strategy on mathematical creative abilities of urban and rural children.

(iii) To compare the effect of the specially designed teaching strategy on high, average and low levels of general creativity of urban and rural children.

(iv) To compare the effect of the specially designed teaching strategy on high, average and low levels of mathematical creativity of urban and rural children.

(v) To identify the personality factors of high and low general creatives.

(vi) To investigate the biographical factors of high and low general creatives.

(vii) To investigate the personality factors of high and low mathematical creatives.

(viii) To investigate the biographical factors of high and low mathematical creatives.

(ix) To find out whether there is any significant difference in the personality factors of urban and rural children who were found to be creative on the basis of their general creativity scores.

(x) To find out whether there is any significant difference in the personality factors of urban and rural children who were found to be creative on the basis of their mathematical creativity scores.
To study the relationship between general creativity in respect of fluency, flexibility, originality and elaboration on urban and rural samples.

Sample:

The sample of the study consisted of 277 (165 urban and 112 rural) VII and VIII class pupils purposely selected from two intermediate college of Sultanpur District in U.P. The sample used for study was purposive.

Tools:

The following tools were used for the collection of data.

(i) General Creativity Test - Verbal and Non-verbal developed by Mehdi (1973).

(ii) Mathematical Creativity Test developed by the investigator.

(iii) Hindi adoption of Thorndike Dimensions of Temperament Test by Mehdi and investigator.

(iv) Biographical Inventory developed by Mehdi.
Syntax or Phasing:

The syntax or phasing of the teaching model involves a description of the teaching strategy in action. It tells us about the shape of the activities which typify the particular educational environment belonging to each teaching-learning strategy.

The specially designed Teaching Strategy consisted of six phases:

**First Phase**: The students were familiarized with concept, principles and formulas of mathematics.

**Second Phase**: The problem were analysed with the help of students.

**Third Phase**: Students were initiated to develop hypotheses in mathematics situation.

**Fourth Phase**: Students were motivated to collected data for the verification of hypotheses.

**Fifth Phase**: The hypotheses were varified in terms of logical validity.

**Sixth Phase**: The generalizations were drawn about the solutions of the problem.
Findings:

The findings of the study were:

(i) The effect of the specially designed teaching creativity, viz., fluency, flexibility, originality, elaboration and also on general creativity as a whole among urban and rural children were found to be significant.

(ii) The effect of the specially designed teaching strategy on originality (verbal) and elaboration (non-verbal) dimensions of mathematical creativity was not found significant in the short duration of the experiment.

(iii) The specially designed teaching strategy for the development of creative thinking abilities among children were found to be more effective with the high creatives than with the average and low creatives.

(iv) The specially designed teaching strategy was found more effective with the high mathematical creatives than with the average and was not found at all effective with the low creative.

(v) Rural high and low general creatives were found to differ significantly from the another only with
respect to three personality factors, viz. impulsive, active and responsible. Rural high creatives are planful, active and responsible.

(vi) Rural high and low general creatives were found to differ significantly from one another with respect to socio-cultural and educational background interest patterns and level or aspiration.

(vii) Urban high and low mathematical creatives were found to differ significantly from one another only with respect to three personality factors, viz., cheerful, placid and impulsive.

3.3.8 The Effect of a Creative Teaching Model in Mathematics on the Achievement and the Attitude of Ninth Class Student.  

Objectives:

The objectives of the study were:

(i) To develop a programme in Mathematics which promotes both cognitive and affective growth in pupil.

To evaluate the programme by studying its effect on pupils' achievement and attitude.

To study the effect of factors like sex, parental education, students' motivation on the achievement and attitude of the pupils.

Sample:

The study was undertaken on the sample of 112 students of IX class of Shri M.G. High School, Guntur, Andhra Pradesh.

Tools:

The following tools were for measuring the four independent variables and two dependent variables.

(i) School record for achievement scores.

(ii) Attitude scale developed by H.G. Desai.

(iii) Motivation- JIM Scale developed by the extension Unit of M.B. Patel College of Education, Vallabh Vidyanagar.

(iv) Parental education - a bio data sheet developed by the investigator.

Procedure:

The programmes for the creative teaching model was developed by the investigator on the basis of the Williams'
three dimensional model to implement cognitive-effective behaviours in the classroom. The programmes were prepared for Telugu speaking students.

The treatment was given to the experimental group. The 2^4 factorial design was chosen for the study. The F-test was used to test the significance of the effects of various factors.

**Findings:**

The findings of the study were:

1. The Creative Teaching Model (CTM) had significant effect on both achievement and attitude of the students. The achievement and attitude towards mathematics of the experimental group showed considerable improvement.

2. Though boys and girls differed in achievement, their attitudes did not differ significantly.

3. The first order interaction effect of sex and motivation was significant for both achievement and attitude.
3.4 RESEARCH STUDIES IN OTHER COUNTRIES

The review of the research studies done in other countries is made hereafter.

3.4.1 Creativity Training in Elementary Schools in Brazil.12

This study was done by John Feldhusen and Fred Widlak at the University of Bazitia. In this study fourteen out of twenty six stories of the Purdue Creative Thinking Programme (PCTP) and corresponding exercise were used with a sample of children in Brazil. The choice of 14 dramatized stories was based on their relationship to the programme of history and social studies in Brazilian schools. The programmes were translated into Portuguese by the first author.

Sample:

A total of 578 fourth and fifth grade children

From twenty four classes in both private and public elementary schools in Brazil participated in the study.

There twelve fourth grade and twelve fifth grade classes with eight classes assigned to each of two treatment conditions (programmes with reinforcement of pupils' performance on the creativity exercises and programmes without reinforcement of pupils' performances on the creativity exercises.) and eight classes assigned to the control group conditions.

**Procedure:**

Before instruction began two verbal sub-tests (unusual and product improvement) and two figural sub-tests (circle and picture completion) of the Torrance (TTCT) were administered as pre-test to all pupils in both the experimental and controlled groups. The tests were translated into Portuguese. The instructional material was then administered to the experimental groups by the teacher once a week. For the fourteen consecutive weeks the teacher read the instruction and the story to children where tape players were not available. The pupils then worked on the printed exercises. In one experimental condition (programme with reinforcement) the exercise completed by the
children were evaluated by the experimenter. She wrote encouraging comments on their paper intended to reinforce fluency and elaboration (e.g., very good) good, good but try harder, the harder etc., and then gave back to children. Pupils in other experimental condition received no infor-
ment. Pupils in the controlled group received no creati-
vity training. At the end of twenty eight weeks TTCT form A was administered as post-test to all pupils of the project.

A 3 x 2 x 2 (Treatment x Sex x Grade) analysis of covariance was used to analyse pupils performance on each of the twelve creativity measures. Previous research indicated that the creativity sub-tests were task specific and should be analysed separately. The co-variates for the divergent thinking measures were the respective TTCT Pre-
test measures. Post-hoc individual comparisons between adjusted means were made for significant effects using the Newmankevls procedures. Further analysis of co-variance were carried out to analyse the effect of treatment using the class as the sampling units.
Findings:

Using individual subject as the sampling unit, a consistent finding across all dependent variable was that no interaction effect reached statistical significance. The main effect of the treatment was significant for all the three creativity dimensions of Fluency, Flexibility and originality for lines and unusual uses sub-tests. Here the treatment effect was also significant for figural fluency on the lines and picture completion sub-tests; and for verbal originality on the unusual uses sub-test. The significant classes within treatment effect indicates differences among the classes in the effectiveness of the programme.

3.4.2 Improving Children's Creative Problem-Solving:

The Purdue Creativity Project 13

In this study Purdue Creative Thinking Programme (PCTP, Feldhusen, Treffinger and Bahlke, 1970) and the

Productive Thinking Programme CPTP, Covington, Crutchfield Davies and others (1972) were used with the sample of elementary school children.

**Objectives:**

The specific objectives of the study were:

(i) To evaluate the effectiveness of the PTP and the PCTP under conditions of self instructional use by pupils, compared with utilization which incorporated active teacher participation.

(ii) To compare the effectiveness of the PCTP, in relation to each other as well as to uninstructed controlled groups. Under two distributions of instructions: Massed (Completion of instruction in four weeks) and distributed (completion of instruction in eight weeks.)

(iii) To compare the effectiveness, in each of the conditions specified above, in classes taught by teachers who were themselves high and low in divergent thinking ability.

(iv) To assess the effectiveness of the programmes under the conditions specified in objectives one through three, with respect to several criteria of creative thinking and problem solving.
Sample:

Seven hundred ninety three pupils and their teachers participated in the project. The subjects came from 36 fifth grade classrooms in two public systems, one in northern and one in central Indiana.

Procedures:

The Torrance Tests of Creative Thinking (TTCT) were administered to all to determine their level of divergent thinking ability. On the basis of their composite fluency, flexibility and originality scores the teachers were assigned either to a high group (above the Median) or a low group (below the Median). Two classes in each group were then randomly assigned to experimental arrangements (PCTP or PTP, 4 weeks or 8 weeks Discussion or Non-discussion).

The teacher in discussion group were asked to participate actively with their pupils in the creatively instruction, and to initiate activities which would provide applications of the instruction to other classroom lessons. They were also given suggestions for bulletin boards, games role
playing, other activities which would relate the instruc-
tional programme's content to other school situations.

In non-discussion groups the teachers were asked
to distribute the creativity material, answer pupils routine
questions and supervise their classrooms, but not to discuss
specifically the content of the programmes or otherwise to
make any special attempts to encourage creative thinking
among their pupils. Four controlled groups received no
special instructions nor were these groups stratified by
level of teacher's divergent thinking ability. Therefore,
a factorial design (2 x 2 x 2 x 2) with a single control
group stratistical procedures followed.

Tools:

The following tools were administered to all
pupils in experimental and controlled classes.

(1) Torrance Test of Creative Thinking:

All the pupils were given five sub-tests
from Form B of the TTCT as a pre-test and five
comparable sub-test from Form A as post-tests.
Three sub-tests involved verbal content and two
involved figural content.
(ii) The Old Black House Problem:

The Old Black House, a programmed problem solving task was developed at the Berkeley Creativity Project and has been used in other studies of effectiveness of the productive Thinking Programme (PTP). The children were given as a post-test, a brief story involving a derived by using criteria developed by the authors of the test.

(iii) Real Life Problems:

Two real life problems entitled "Fighting on the playground" and "Life of School" were presented as post-test to all the pupils. Both tests were scored for the number of solutions generated.

(iv) Other Problems:

Finally all pupils were also given to verbal problem-solving tasks and the first was a multi-students anagram task called 'Antelopes.' Each problem was scored for the number of solutions produced.
Findings:

The findings of this study were:

(i) Both the Purdue Creative Thinking Programme (PCTP) and the Productive Thinking Programme (PTP) have been shown the effect significant enhancement of fifth grade children's divergent thinking ability (particularly verbal abilities).

(ii) Both the programmes have been shown to be associated with superior performance by fifth grade pupils, in comparison with controls, on several criteria of Creative Problem Solving.

(iii) When the programmes were utilized in as short a period of time a four weeks, superior performance seemed to be associated more frequently with non-discussion and with teachers rated low divergent thinking.

(iv) The PTP, originally designed as a self instructional programme, appeared to be less influenced by variations in the rate of presentation of teacher participation and teacher's level of divergent thinking. For the PCTP, however, there were some evidences that as the rate of presentation became slower, the role of discussion and the positive effects of high divergent thinking ability in the teacher increased.
3.5 RATIONALE OF THE PRESENT STUDY

The main objective of education in a democratic society like India is to develop the mental abilities of the students. The school programmes should be prepared in this direction. They should try for the development of thinking abilities viz. convergent and divergent thinking. But it can be seen that a compared to convergent thinking, very little is being done for the development of divergent thinking in our schools. This requires boosting of creativity in individuals from the school life.

Creativity is considered to be one of the highest attainments of human intellect. It has a broader connotation than is commonly understood. Creative expression is a form of learned behaviour which can be developed by application of appropriate teaching practices and by manipulating environmental conditions in the classrooms. It is found that creativity can be achieved within a shorter time with the programmes of creative thinking and creative teaching in any school subject.
A variety of interrelated factor that enhance creative ability imply that an attempt to develop creative ability will be more effective if the teaching method includes the strategies which are designed to create favourable conditions.

The review of all the related studies helped the investigator to select the variables, their nature and levels, a research method and designed pertaining to the problem in hand.