Chapter III
Research Methodology

3.1 Introduction

The present study aims at examining the "Learning Outcome of Students in Relation to Pedagogical Content Knowledge of Elementary Teachers". It may be easy to find out the learning outcomes but is very difficult to assess whether the teachers are using the correct pedagogy to teach in the classroom. Also, another difficult task is to know by which pedagogy the teacher is using during teaching-learning process. The researcher tried to find out both the items in this research. The questionnaire was administeredto know/ identify the actual methodology used in the classroom.

3.2 Research Methodology

The methodology used in the present research has been explained under the following steps:-

Step I: Research design

Step II: Sample design

Step III: Tools

Step IV: Data collection

Step V: Statistical techniques

STEP I: - Research Design

*Best and kahn (1989) states, "Descriptive research is concerned with all the hypothesis formulation and testing, the analysis of the relationship between non-manipulated variables and the development of generalization. In descriptive research variables that exist or have already occurred are selected and observed".*One standardized test on **"**Teachers' Technological Pedagogical and Content Knowledge Scale" and one questionnaire on "Pedagogy and Teaching Learning Process at Elementary Level" were used to collect data.

STEP II: -Sample Design

To serve the purpose of the present study, Purposive sampling technique was used. A total number of 276elementary school teachers constituted the sample of the study. The samples were drawn from 276 elementary schoolsfrom five blocks of Mahendergarhdistrict of Haryana. Distribution of samples has been depicted in table 3….

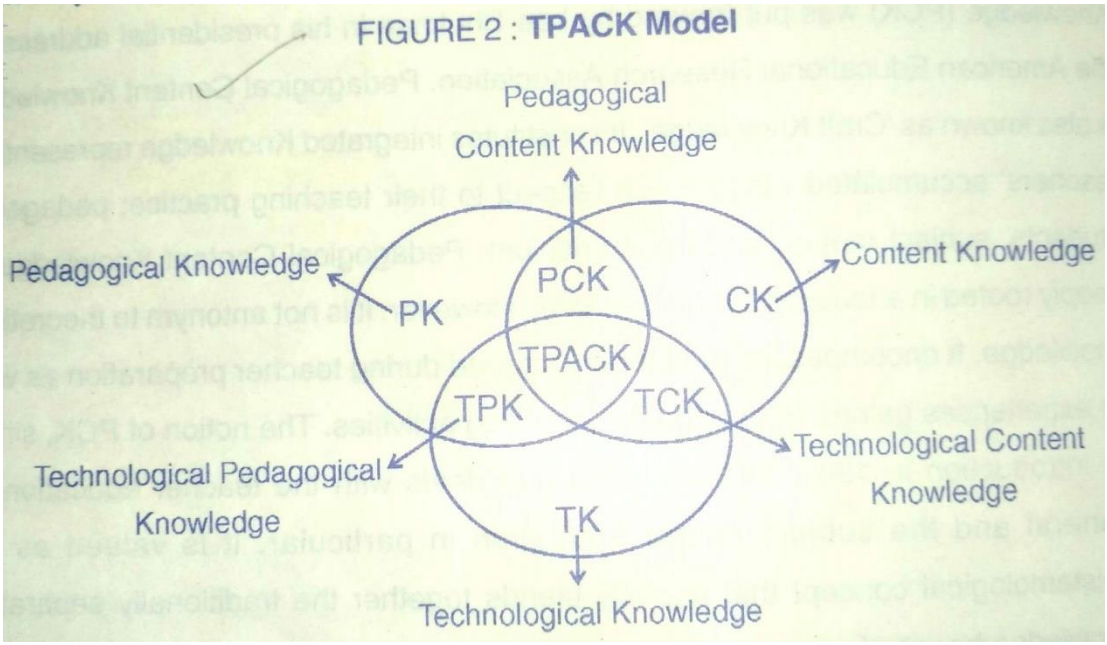
Table 3…..Distribution of Samples

District Mahendergarh				
Block Ateli	Block Narnaul	Block Kanina	Block Nangal Chaudhary	Block Mahendergarh
50	48	55	51	72
Total No. of Schools = 276				
Total No. of teachers teaching Social Science= 276				

STEP III: -Tools

1. The researcher used standardized tool collecting the data. The tools used for the present study were: -

   "Teachers' Technological Pedagogical and Content Knowledge Scale (TTPACKS-SHSL) by Prof. HemantLata Sharma and Ms. Leena Sharma".



Components of TPACK

1. "Technological Knowledge – Technological Knowledge (TK) is oriented to various technologies and their use. Technology is used to support the teacher while giving the content to the students, to support the dialog between the teacher and the student, or for presenting the content to the students".
2. "Pedagogical Knowledge – Pedagogical Knowledge (PK) is knowledge that includes the strategies and principles of classroom management and organization in education. It is the knowledge of learning-teaching processes, applications or methods. It is the knowledge that is oriented to general classroom management skills, lesson planning, student assessment and knowing the learning styles of student and the practice of teaching accordingly".
3. "Content Knowledge – Content Knowledge (CK) is the amount of the actual knowledge and organization in the mind of the teacher. Content Knowledge (CK) is knowledge about the subject matter that is to be learned or taught,

including, for example, middle school science, high school history, undergraduate art history, or graduate-level astrophysics. Knowledge and the nature of the inquiry differ greatly among content areas, and it is critically important that teachers understand the disciplinary "habits of mind" appropriate to the subject matter that they teach".

4. Technological Pedagogical Knowledge - Technological Pedagogical Knowledge (TPK) is an understanding of how teaching and learning change when particular technologies are used. This includes knowing the pedagogical affordances and constraints of a range of technological tools and resources as they relate to disciplinary and developmentally appropriate pedagogical designs and strategies.
5. Technological Content Knowledge - Technological Content knowledge (TCK) is the knowledge of the presentation of technology and subject matter. This knowledge provides for the flexibility of use of the appropriate technologies for educational purposes. Technological Content Knowledge (TCK) includes and understanding of the manner in which technology and content influence and constraints one another. In planning for instruction, content and technology are often considered separately.
6. Pedagogical Content Knowledge - Pedagogical Content Knowledge (PCK) includes the understanding that provides the learning of both tough and easy subjects. It is the knowledge of different teaching methods for different subjects. It is the blending of pedagogy and content within the understanding of the presenting of certain subjects and dealing with the problems in education, the way of organizing, representing and adapting different student interests and skills.

7. Technological, Pedagogical and Content Knowledge –"Technological, Pedagogical and content knowledge (TPACK) is the knowledge of the use of technology in various subjects and practicing teaching methods. This knowledge makes the learning of the subject for the student easier with appropriate pedagogy and technology. TPACK is the base for effective teaching with technology which includes an understanding of how to present concepts with technology, how to use pedagogical techniques that use technology in teaching the content indirectly, the knowledge of the concept which makes learning easier or harder, the knowledge of how the technology will be helpful for learning, the knowledge of the students' Previous knowledge and the knowledge of epistemological theories, the knowledge of how to use technology in building new information onto existing knowledge and which also includes the development of new epistemologies, or strengthening the old ones".

Table: Dimensions of TPACK

	Dimensions	Nature of Items	Item No.	Total
1	Technological Knowledge	Positive	1 to 5	5
2	Pedagogical Knowledge	Positive	6 to 13	8
3	Content Knowledge	Positive	14 to 21	8
4	Technological Pedagogical Knowledge	Positive	22 to 32	11
5	Technological Content Knowledge	Positive	33 to 38	6
6	Pedagogical Content Knowledge	Positive	39 to 45	7
7	Technological, Pedagogical and Content Knowledge	Positive	46 to 55	10
	Total			55

2. **Questionnaire (Self Constructed) Pedagogy and Teaching Learning Process at Elementary Level**

   This questionnaire is consisting of eight questions and every questions has some items.

Q.1 How Teaching of Social studies subject is helpful in Developing Values?

Q.2. what is the Principles of Curriculum Construction/ Curriculum preparation in your school? Do you participate in Curriculum designing?

Q.3. Which Self-Instructional Modules do you use while teaching Social Studies?

Q.4 What is the need and importance of Self Instructional Material in Social Studies?

Q.5 What are the methods of teaching social studies?

Q.6 What is the skills in teaching social studies?

Q.7 What procedure do you adopt in planning the lesson?

Q.8 What do you think about the importance of Evaluation?

Step IV: Data collection

The data were collected from 276 elementary school teachers of five blocks of Mahendergarh district. In each school there is a single teacher of social studies subject. Initially researcher had taken permission from the department for the data collection and then he went to each school for data collection. There researcher had interacted teacher of social science for reporting the views.

Step V: Statistical techniques

1. **Quantitative Analysis(Teachers' Technological pedagogical and content knowledge)**

Mean and Product Moment Coefficient of Correlation were used.

- **Mean**

  The formula for the calculation of mean is

$$M = \frac{\sum X}{N}$$

  Where,
  M = Mean
  X = Sum of Mean
  N = no of measures in the series

- **Coefficient of Correlation**

  Karl Person's coefficient of correlation (r)-

$$r = \frac{\sum xy}{n\sigma x\sigma y}$$

  Where,

- $x = (x_1 - \bar{x})$
- $y = (y_1 - \bar{y})$
- $\sigma x = S.D. of\ x$
- $\sigma y = S.D. of\ y$
- N= Number of pair observations

2. Quantitative analysis (Pedagogy and Teaching Learning Process at Elementary Level)

For Quantitative Analysis of Pedagogy and Teaching Learning Process at Elementary Levelsamples were taken through self- constructed questionnaire. After obtaining the responses from the respondents, the responses were subjected to quantitative analysis. **Category of the Data:** Interaction with teachers on the various areas the components of social science subject is essential and the objective of its teaching like developing values, principle of curriculum construction, instructional strategies, instructional material, instructional methods, teaching skills, lesson planning and the ways of evaluation and its importance.

Q.1 How Teaching of Social studies subject is helpful in Developing Values?

The analysis was based on the following components: Knowledge Structure, Development of Competence in Problem Solving, Relevant Understanding,

Development of Desirable Attitudes, Provides Training in Co-Operation, Development of Character, Development of Thinking and Reasoning Power, Development of Global Understanding, Development of Socio cultural Understanding, Development of Habits of Adjustability and Flexibility, Development of Skill in Responsible Group Participation, Development of Healthy Teacher Pupil Relationship, Development of Skill in Enquiry and Decision Making, Development of Skills of Tolerance and Openness, Development of Skills in Studying and LearningProvides Basis for Specialization

Q.2. what is the Principles of Curriculum Construction/ Curriculum preparation in your school? Do you participate in Curriculum designing?

The analysis was based on the following components: Child centeredness, Community centeredness, Flexibility, Integration, Keeping aims and objectives in view, Utility, Development of democratic values, Principle of creativity, Being tentative rather than final Conservation of culture, Forward looking, Studying current affairs, Developing ideals and loyalties, Based on actual experience of the student, Sensitivity to changing needs and values, Achievement of wholesome behavior pattern, Principle of readiness

Q.3. Which Self-Instructional Modules do you use while teaching Social Studies?

The analysis was based on the following components: Individualized Instructional Modules (Programmed Instruction, Computer assisted instruction, Project, Assignment etc.) and Group-Directed Instruction Modules (Discussion, Debate, Symposium, Panel discussion, Brain Storming).

Q.4 What is the need and importance of Self Instructional Material in Social Studies?

The analysis was based on the following components: Clarity of the subject, To make the subject interesting, Based on maxim of teaching, Saving of time and energy,

Development of scientific attitude, Provide motivation, Effective for slow learners, Develop friendly relation between pupils and teacher, Supply new experiences and new energy, Helps in the association of ideas, Provision of sensory experience, Substitutes for direct experiences, Help making learning Permanent, Meet the requirement of individual differences, Provide opportunities for activities and Help in increasing the vocabulary of the students.

Q.5 What are the methods of teaching social studies?

The analysis was based on the following components: Story telling method, Lecture method, Project method, Unit method, Problem solving method, Discussion method, Socialized recitation method, supervised study method, Inductive and Deductive method, Text book method, and Laboratory method.

Q.6 What is the skills in teaching social studies?

The analysis was based on the following components: Skill of Introduction, Skill of Questioning, Skill of Explaining, Skill of Illustration with examples, Skill of Stimulus variation, Skill of Map reading, Skill of Reinforcement, Skill of Class room management, Skill of Narration, Skill of Presentation, Skill of using black board, Skill of increasing pupil's participation, Skill of Team teaching, Skill of role playing and Skill of silence and non-verbal clues.

Q.7 What procedure do you adopt in planning the lesson?

The analysis was based on the following components: Aims and objectives (General objectives, Subject objectives, Unit objectives and The specific objectives of the daily lesson), Selecting and arranging the subject matter and Determining the methods of teaching.

Q.8 What do you think about the importance of Evaluation?

The analysis was based on the following components: Knowledge about the progress of the student, helps in clarifying objectives, helps in classification of the student, Basis of admission, Basis of planning of education, Basis of guidance, helps in testing the efficiency of the teacher, Promotion of better learning, helps in bringing change in curriculum, and Help in awarding scholars.