# Chapter-1:

# Introduction

## 1.0 Introduction

The future of the nation is steered in a positive direction by developing the basic intelligibility in mathematical operations i.e., by *'the mathematisation'(NCF-2005)* of learners. The narrow aim of school mathematics is to develop *'useful'* capabilities, particularly those relating to numeracy-numbers, number operations, measurements, decimals, and percentages. For perfect mathematisation its necessary that learners have an understanding of numbers-numeracy and there operations i.e., knowledge how to add & subtract any two quantities, multiply and divide any two quantities at the elementary stage of learning so as to move to abstractness from concreteness.

But it's very unpleasant experience for a teacher who encounters that learner at elementary level specifically upper-primary level don't have sufficient hand on in handling operations on numbers, that are very frequent in mathematics and without its mathematics cannot be imagined, of these numbers the most important part is operations on *integers* i.e., there addition, subtraction, division and multiplication. If a learner fails to understand the operations on integers probably s/he may not be able to move to abstractness and would indulge in self-conflict to leave mathematics or does not like mathematics. To ensure the understanding and love towards mathematics it should be kept in mind to generalise and explain the ideas of mathematics in a simple language using relevant pedagogy and make learners understand the concepts.

Also, it is evident that learners bring with them several experiences, some related to their learning outside the school and some related to their previous learning tasks. Whenever they come across a new task, they rely on their previous knowledge & learning and thus make

interpretations. At times in mathematics, these prior notions may hinder the learning process which results in misconceptions or committing errors. Errors in mathematics may arise from many sources that can range from lack of understanding to mis-conceptualising of numerals. Whatever may be the source, when these errors show particular pattern, it reflects an absence of conceptual understanding & framework and thus calls for attention to inspect and analyse and try to alleviate them.

### 1.1 Need of the Study:

In the present context and contemporary for effective development of cognition/core-competencies and logico-mathematical abilities a strong foundational basis of every competency and skill in mathematics is required, as it is involved directly or indirectly in other subjects, e.g., science, technology, engineering, arts, or humanities etc. Apart from this the foundation of elementary mathematics lies back at learning of arithmetic and more specifically knowledge of solving problems on integers.

Hence, it is highly recommended that the foundational basis shall be highly strong to gain required skills and competencies as it will not hinder or obstacle higher learning. Since, every child is a potential learner, it is the duty of the teacher that s/he too provides them environment to learn more effectively. Hence, the teacher is expected to nurture learners such that they may acquire knowledge of these core foundational skills. and its only possible when a teacher knows the expected errors committed by the learners while solving problems related to

operations on integers so as to rectify them at the very early stage.

## 1.2 Statement of the Problem

The present study will be undertaken with an objective that the research findings would help to identify the common errors following a particular pattern committed by learner while solving the problems on integers.

Wherein, sincere attempts will be made to identify those errors and provide suggestive measures /alleviation through interventions to rectify those errors at the very early stage.

The proposed problem for the present study stated herein is *"A study of Identification of Errors in Learning Integers and its Alleviation"*

## 1.3 Definitions of Operational Terms to be used in study:

1. **Identification of Error's-**Identification of errors here refers to finding the commonly occurring mistakes while solving arithmetic problems by learners which show a *particular pattern* repeatedly.
2. **Mathematics Learning-**As per the Encyclopedia of the Sciences of Learning "*Mathematics learning can be broadly defined as the acquisition of new knowledge, skills, and affects that are related to quantity, space, and structure.*" And in simple words it is defined as the process of acquiring knowledge, expertise and understanding about a phenomenon, operations, concepts, analogies etc.

3. **Integers-**Britannica defines *"**Integer**, as whole-valued positive or negative number or 0. The integers are generated from the set of counting numbers 1, 2, 3,... and the operation of subtraction."* Therefore, an integer is colloquially defined as a number that can be written without *'fractional components.'* Integers are the set of whole numbers and negative numbers. Ex: 21, 4, 0, -3, -9, -100, 1234 etc.
4. **Alleviation-** Alleviation is the treatment given to make something, such as pain or suffering more bearable i.e., reduce the hindrance faced in learning.
5. **Interventions-**Interventions are defined as the actions performed to bring about requisite& desired change in learners understanding and knowledge and rectify the prior misconceptions or errors leftover in learner's meta-cognition.
6. **Mathematical Operations-**The mathematical *'operations'* refers to calculating a value using operands and a math operator. The symbol of math operator has predefined systematic rules to be applied to given operands or numbers.

## 1.4 Objectives of the Study

The present study will be taken up with the following objectives-

i. to identify the of common errors committed by learners while performing operations on Integers,
ii. to analyse the possible cause why those errors, are being committed,
iii. to alleviate errors committed by students through interventions.

## 1.5 Delimitations of the Study

As stated earlier, the present research will be aimed at to investigate and identify the errors committed by learners while solving problems on integers at elementary level and to give necessary interventions. Hence, this study too will have certain constraints of space, time, and resources as may be the case in any such similar studies conducted.

1. The study will be confined only to the schools of Mangalpur Kshetra Panchayat of Kanpur Dehat.
2. The study was confined to the schools located in rural areas.
3. The study was comprised of sample of almost four schools.
4. The study was only done based on prescribed syllabus for elementary schools.
5. The problems given in tool were based on NCERT textbooks of elementary grade.