

CHAPTER - 1

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1.1.0 Introduction

Goals of Mathematics Education

What are the main goals of mathematics education in schools? Simply stated, there is one main goal—the mathematization of the child's thought processes. In the words of David Wheeler, it is ⁶⁶ more useful to know how to mathematize than to know a lot of mathematics¹.

According to George Polya, we can think of two kinds of aims for school education: a good and narrow aim, that of turning out employable adults who (eventually) contribute to social and economic development; and a higher aim, that of developing the inner resources of the growing child. With regard to school mathematics, the former aim specifically relates to numeracy.

What about the higher aim? In developing a child's inner resources, the role that mathematics plays is mostly about thinking. Clarity of thought and pursuing assumptions to logical conclusions is central to the mathematical enterprise. There are many ways of thinking, and the kind of thinking one learns in mathematics is an ability to handle abstractions.

1.1.1 A Vision Statement Of 2005

In our vision, school mathematics takes place in a situation where:

- *Children learn to enjoy mathematics*:- This is an important goal, based on the premise that mathematics can be both used and enjoyed lifelong, and hence that school is best placed to create such a taste for mathematics.
- *Children learn important mathematics* :- Equating mathematics with formulas and mechanical procedures does great harm. Understanding when and how a mathematical technique is to be used is always more important than recalling the technique from memory, and the school needs to create such understanding.

Children see mathematics as something to talk about, to communicate, to discuss among themselves, to work together on.

- *Children pose and solve meaningful problems* :- In school, mathematics is the domain which formally addresses problem solving as a skill.
- *Children understand the basic structure of mathematics* : Arithmetic, algebra, geometry and trigonometry, the basic of content areas of school mathematics, all offer a methodology for abstraction, structuration and generalization.
- *Teachers expect to engage every child in class*:- Setting for anything less can only act towards systematic exclusion in the long run.

1.1.2 Construction in Mathematical thinking.

Before we pass on to the more logical aspects of mathematical thinking we must say a few words about the constructive aspect of such thinking. Constructive thinking takes place when one aims at set of requirement and attempts to build a structure which will meet them . We know the kind of structure we are aiming at and somehow, without quite being aware of all the internal intricacies we are constructing, we manage to build a structure with the state requirements. An artist does essentially this kind of thinking; he does not know exactly what picture he will have painted before he has painted it but he has a definite idea in mind of the kind of picture he wants it to be. He appears equally certain when he does not succeed in his attempt to measure up to his own standard, although he would probably find it difficult to put his reasons into words. Mathematical constructions eventually arise out of mathematical manipulative play; what we call one construction is largely arbitrary, as practically every construction can be built on to as well as taken down form, and it may be difficult to say where one construction ends and another begins.

1.1.3 Meaning of Constructivist Approach.

In the constructivist approach, learning is a process of the contraction of knowledge. Learners actively construct their own knowledge

by connecting new ideas to existing ideas on the basis of material presented to them (experience).

For example, using a text or a set of pictures on a transport system coupled with discussions will allow young learners to be facilitated to construct the idea of a transport system. Initial construction may be based on the Idea of the road transport system, and a child from a remote rural setting may form the idea centered around the bullock cart. Learners construct mental representations (images) of external reality (transport system) through a given set of activities (experiences). The structuring and restructuring of ideas are essential features as the learners progress in learning . For instance, the initial idea of a transport system built around road transport will be reconstructed to accommodate other types of transport systems- sea and air-using appropriate activities. The engagement of learners, through relevant activities, can further facilitate in the construction of mental images of the relationships (Cause effect) between a transport system and human life. However, there is a social aspect in the construction process in the sense that knowledge needed for a complex task can reside in a group situation. In this context, collaborative learning provides room for negotiation of meaning, sharing of multiple views and changing the internal representation of the external reality. Constructions indicates that each learner individually and socially constructs meaning as he/she learns. Constructing meaning is learning. The constructivist approach provides strategies for promoting learning by all.

1.1.4 Constructivist Approach to Planning

Our educational practice is still based on limited 'lesson plans' aimed at achieving measurable 'behaviors'; according to this view, the child is akin to creature that can be trained, or a computer that can be programmed. Hence, there is too much focus on 'outcomes', and presenting knowledge divided into bits of information to be memorised directly from the text or through activities after 'motivating' children, and finally on evaluating to see if children remember what they have learnt. Instead, we need to view the child as ' constructing knowledge' all the time. This is true not only of 'cognitive subject' such as mathematics and

science, language and social science, but equally of values, skills and attitudes.

- Organizing experiences

Observing something happen, say, the process of seed germination, in a real situation or observing different stages of milk collection, processing and packaging different kinds of products in a dairy farm.

Participating in an exercise involving body and mind such as planning a role play around a theme and presenting it.

Talking about and reflecting on something the child has experience of (e.g. dialogue on gender differentiated practices in the family and society or participating in a mental game of numbers).

Making something, say, a system of gear wheels or trying out an experiment to lift a load using a system of pulleys.

After the experience, teachers could organise a discussion, an exercise involving, writing, drawing and display. She could identify along with the children questions to be thought about and answered.

She could connect the experience with textbook knowledge and other references and deepen the experience.

Such experience and post- experience activities could be valuable at any level of schooling. Only the nature and complexity of the experience would need to change over the years. Language is key to organising experience. Hence, there should be a proper coordination between the kind of experience and the level of language development.

1.2.0 Need of the Study

Article 45 of Indian constitution, it is the obligation of state to provide free and compulsory education for the children of age between 6-14 years. Universalization of elementary education is the aim of present education system.

Universalization of elementary education includes universal access, universal retention and universal success. The first two can be achieved to

desire extent by providing certain basic physical facilities but the problem of universal success is very difficult to achieve success percentage of the students at different level of schooling exhibits dismal picture, stagnation in mathematics has been at the top among other school subjects. Various findings suggested that one of the reasons for stagnation has been faulty pedagogy that has been practiced in our school. Therefore, need for pedagogical practices and material or learning situations is largely felt.

The elementary education in our country is in a very bad shape. The prescribed curriculum is with a sense of load rather than with joy. The situations is more serious in elementary classes children have to face traumatic experiences every day. The feeling of success motives the children to remain in the school while the feelings of "failure" pushes them out of the system. In this case many children dropout to unattractive and uninteresting programmes that schools offer. Therefore, we could not achieve our goal, which is given, in our constitution universalization of elementary education.

For the systematic learning of geometry there is always need of some sort of assistance in the form of educational learning situations Hence, in teaching learning geometry text books are used as powerful tool. Nowadays, the constructivist learning situation which is being produced helps in learning geometry. Some of the shortcomings of the past textbooks have been overcome. The learning situation present today is more interesting, relevant and the contexts is closer to the learners but inspite of above improvement present textbook though take care of average and above learners needs but because of certain limitations, the needs of poor learners are not taken care of.

Inspite of qualities and appropriateness of the textbook, there are certain limitations of the textbook. They can not fulfill the needs of every individual. Keeping this view in mind the need of constructivist learning situation is being felt to create congenial environment for learning and to provide greater exposure to the target.

1.3.0 Statement Of The Problem

The present study is entitled as-

"Influence of Constructivist Approach in Achievement of class V-students in "Geometry" Concept pertaining to Angle."

1.4.0 Definitions Of Terms

A number of educational term have been used in working on problem and in reporting the study. The important terms, very frequently used in the study are :-

1. *Constructivist Approach*

In the constructivist approach, learning is a process of the construction of knowledge. Learners actively construct their own knowledge by connecting new ideas to existing ideas on the basis of material/learning situations presented to them (experience).

2. *Constructivist Learning Situation*

Constructivist Learning situations that are designed to ensure that children will be encouraged to seek out knowledge from sites other than the textbook, in their own experience.

These constructivist learning situations are challenging and allow independent thinking, and multiple ways of being solved.

3. *Angles*

There are five concept of angles. They are angle, kinds of angles, degree measure of angle, pairs of angles and perpendicular lines. In order to compare the achievement level of student in these concept.

1.5.0 Objectives Of The Study

Following objectives are kept in view while conducting this investigation:

1. To study the influence of constructivist approach on achievement of class V students in geometry.
2. To find out the difference between private School and government school on achievement of class V students in geometry.
3. To find out the gender wise difference on achievement of class V students in geometry.

1.6.0 Hypothesis

The objectives stated above helped the investigation to formulate the major hypothesis of the study. It is presented in null form:

1. There will be no significant difference in influence of constructivist approach on achievement of class V student in geometry.
2. There will be no significant difference between private school and govt. school on achievement of class v students in geometry.
3. There will be no significant difference between boys and girls on achievement of Class-V students in geometry
4. There will be no significant difference between boys and girls of private school on achievement of class V students in geometry.
5. There will be no significant difference between boys and girls of government school on achieving of Class V student of private school in geometry.
6. These will be no significant difference between pre test and post test on achievement of class V students of private school in geometry.
7. There will be no significant difference between pre test and post test on achievement class V students of government school in geometry.
8. There will be no significant difference between pre test and post test on achievement of class V boys of private school in geometry.

- 9 There will be no significant difference between pre test and post test on achievement of class V girls of private school in geometry.
- 10 There will be no significant difference between pre test and post test on achievement of class V boys of government school in geometry.
- 11 There will be no significant difference between pre test and post test on achievement of class V girls of government School in geometry.

1.7.0 Significance Of The Problem

By this study, suitable suggestions can be made for improving the teaching of mathematics in schools. Various constructivist learning situations can be suggested for effective as well as corrective learning of various important basic skill. Various learning problem related to mathematics difficulties can be identified.

1.8.0 Delimitations

Following were the limitations of the study:

- (i) The small sample was taken due to limited scope and time of the study.
- (ii) The study was conducted on one class of two school in Junagadh.
- (iii) Standardized tools were not available for this study, so investigator constructed tool.
- (iv) Sophisticated statistical technique for testing the reliability and validity couldn't be used because of limited facilities.