CHAPTER I
# CHAPTER I
## INTRODUCTION

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1.1 CHILD AND COGNITION:

A child is born with no knowledge of himself or of the surrounding environment. From the moment of birth, he is in the process of becoming knowledgeable human beings. The development of a new person right from the beginning is really a mystery. After birth every child exercises his senses and gradually he learns to master verbal sequence for communicating all sorts of purposes. He comes in contact with people, peer groups, objects and events. These experiences provide the child with sets of knowledge. These knowledge may be informal and non-organised. In this way a child is interacting with the environment not as a passive recipient of external forces, but rather as an active organism seeking and organising experiences, thereby coping with the world.

There are different modes of developing knowledge in every society. One way in which societies transmit knowledge is through language. The other modes through which knowledge is transmitted to the child is through educational institution which is a formal mode, while the most informal modes of transmitting knowledge is the every day movements and activities.

Jean Piaget, a noted Swiss Psychologist and epistemologist found it very interesting in developing knowledge in child. It made him interested to know how this process of acquiring knowledge works, what constitute the necessary and sufficient conditions for the development of knowledge and also what comprises the limits of human competence in getting to know the world. Piaget developed his theory of knowledge from
the studies of his own three children, but later on, Piaget and his collaborators in Geneva have worked intensively with different groups of children such as infants, pre-schoolers elementary and secondary school children and finally discovered that children think and reason differently at different periods, thereby constructing knowledge. Gradually, Piaget observed that there is a distinct differences in the thinking process of every child. Their thought process do not have a comparable continuity. It has discontinuous change and development. Every child after birth goes on acting on things and object and thereby forming ideas about the immediate environment, both physical and social in which he lives. He goes on enriching his inner world as he sees it. He moves ahead while making adjustment with the reality outside. He wishes to comprehend the world in which he lives and develop knowledge through the process of thinking. Piaget regarded this process of development of knowledge as 'Cognition' or Cognitive development.

Knowing is commonly referred to as 'cognition,' a continual change defined in the dictionary as "the process of knowing or perceiving, the act of acquiring an idea". On the other hand the term cognitive development is highly generic term covering almost every aspects of behavior. Dictionary of Psychological Terms by English (1934) provides the following definition. "Cognition, a generic term for any process whereby an organism becomes aware of or obtain knowledge of an object". Brunswick (1957) suggested that cognition is the process of acquisition of knowledge. Bloom (1956), in an attempt to classify educational goals states, "cognitive domain includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills".
Piaget's definition of cognition however is much more wider than other psychologists who defined the term cognition as immediate discovery, re-discovery or recognition of information in various forms - comprehension and understanding. This is a general definition of terms utilised for evaluating human abilities. His definition does not include knowledge, comprehension application of some aspects of affective domain such as motivation, affection and skills. According to him, up to 2 years cognition is perception, from 2-7 years, cognition marks the beginning of original language, symbolic functions, logical thinking, trial and correction but lack of co-ordinating ability, difficulty in the realisation that an object has several properties, conservation and reversibility. From 7 to 11 years, cognition represents development of conservation of number, substance, length, area, weight, volume and reversibility. From 12 years onward cognition is marked by the appearance of hypothetical and deductive reasoning, logic of possible combinations, combinatorial system and unification of operations into a structural whole and development of ability to perform and control experimentation etc. Cognition after 16 years of age lets individual to use inter-propositional operations, conjunctions dis-conjunctions, negations and implications.

Piaget is the only psychologist who presented a comprehensive theory of intellectual development involving three critical areas -

1. Intellectual growth proceed in orderly stages, each of which defines what the individual is capable of learning. These stages are (a) Sensori-Motor Stage (0 - 2 yrs.), (b) Pre-Operational stages (2-7 years), (c) Concrete Operational (7-11 years) and (d) Formal-Operational stage (11 years onwards).
2. A substantial body of knowledge describing the developmental course of how children acquire information about the physical world i.e. number, quantity, time, space etc., the social world like morality, social conventions and logico mathematical reasoning like classification, hypothetical-deductive reasoning etc. and

3. A description of a methodology, a clinical method of inquiry which reveals how the child thinks and reasons than just what the child knows.

The most important concepts of development of cognition according to Piaget are cognitive structure, cognitive function and cognitive content. The total cognitive structure which is an integrated whole consists of several isolable structures that undergo both quantitative and qualitative changes during development. In fact cognitive development is synonymous with change in cognitive structure. Thus cognitive development is the development of ways and capabilities of understanding one's world representing it and dealing with it. It is therefore at the very core of one's functioning as a person.

The very purpose of the present study is the cognitive development of children of the concrete operational stage (6-11 years) as described by Piaget in the greater Guwahati area of Assam where the teachers and the parents seldom heard about Piaget and also the children who had never be trained on conservation tasks.

1.2 NEED AND SIGNIFICANCE OF THE PRESENT STUDY :

According to Piaget intelligence is developmental and it acquires through stages. The growth of intellect can be examined through
the vehicle of acquisition of concepts and problems such as number (Piaget, 1952), space (Piaget and Inhelder 1963) and geometry (Inhelder and Szeminska, 1960). Every educator is in a position to establish criteria by which to assess the child's developmental level and to establish relevant levels of curriculum content. On the basis of these theoretical ground, a number of works on Piagetian theories have been done in different parts of the world. From 1970 onwards, lot of studies have been done in India too. Yet it cannot be regarded as enough to give a complete scenario of cognitive development. Some worth mentioning studies which were mainly replication studies has been done by Uzagiris (1964), generally confirmed Piaget's theory of sequential attainment of conservation of substance, weight, volume. However, it has been noted that its sequence was not always constant when different materials were used for testing purposes. Elkind's (1961) study also agrees with Piaget's findings with regard to sequence and the ages at which the children conserved. Lovell (1960) and Ogilvie (1961) used Piaget's plasticine test to examine children's conservation of substance and weight at different ages. Ghakhar and Kaur studied regarding the development of ability to do Piagetian tasks. Bevli (1978) studied about the different variables on cognitive development. Mishra and Tiwari (1983) studied about the environment and cognitive development as well as many other researcher in India also did many works on cognitive development of the children of concrete operational stage.

Several investigator's study on that field supported the assertions made by Piaget, but at the same time, several have questioned its validity and universal application. Thus it is essential to examine the extent to which the results obtained by Piaget and many other investigators can be generalised for different cultures. From the analysis of the previous
studies it has been observed that such studies raised question concerning the reliability as well as appropriateness of their findings in Indian context. Hence there is a great need of this type of study on Indian children having different cultural background. Therefore, the investigator planned the study on primary school children of this region which represent the concrete operational stage as described by Piaget.

Moreover, from the review of the N.C.E.R.T. organised seminar report on Science programme for primary schools by Siddique (1991), it was found that only 5% of the population of primary school children were in formal operational period, while the 95% children were either pre-operational or in transitory period and not able to internalise science and mathematics concepts. This is a very sensitive point to be realised and such studies has to be conducted with the primary school children in Assam because during this period a child's thought become reversible, though it operates within the content of concrete situations, develop some basic concepts like classification, seriation, number, length weight area etc. in a natural way even partially, which Piaget termed as attainment of conservation. Thus this stage has crucial importance as this is the basis for developing rational thinking. This is an urgent need to evaluate the level of development of the primary school children and to evaluate the percentages of these children who are in concrete operational stage and those who are lagging behind.

In this state the studies on cognitive development of different stage level and in different cultural background is still in an embryonic stage. The teachers and the parents seldom heard about Piaget and his theory. The need of such studies has been justified and long been felt. The present investigation is an attempt to study the level of cognitive development of
children of primary schools in Assam as this study would be the first of its kind to be undertaken in North East India. The investigator planned this study on the following assumptions:

1. The study would be helpful in finding out the extent to which the result obtained by Piaget and others are generalizable to the children of Assam.

2. The study would be helpful for the teachers to define the level at which children are functioning and where they are lagging behind in the concrete operational stage.

3. The study would be fruitful enough in revising the curricula, instructional materials, techniques as well as teacher's educational programme at the primary stage of education in this state.

4. The study would be helpful for the teachers and parents to modify and provide such environment in school and home so to accelerate the rate of cognitive development.

1.3 STATEMENT OF THE PROBLEM

In the light of the preceding discussion a study has been undertaken regarding the developmental trend on cognitive development of the primary school children as it is the basis of the rational thinking. Although a considerable researches have been conducted on formal operation stage with adolescence, but very few were of significance so far as primary school children are concerned. Different researchers in this area too revealed that there are many variables which positively or negatively affect the cognitive development of this period. Some of these
variables are age, S.E.S. cultural differences, training, personality factors etc. Therefore the three major variables like child (sex, age, intelligence), home (S.E.S. of parents, parent-child interaction, parental behavior, facilities provided at home), school (School environment, teacher-student interaction, method of teaching, facilities for play at school) have been taken into consideration for the study of the cognitive development of children of Assam and hence the study has been entitled as:

"A STUDY OF COGNITIVE DEVELOPMENT OF PRIMARY SCHOOL CHILDREN IN RELATION TO SOME SELECT SOCIO-EDUCATIONAL VARIABLES".

1.4 OBJECTIVES OF THE PRESENT STUDY

The major aim of the present study was to examine the cognitive development of the children of primary schools of age groups 6 to 10 years. With regard to certain variables like age, sex, intelligence of the child, SES of parents, parent child interaction, parental behavior, facilities provided at home, school environment, teacher-student interactions, facilities for play, method of teaching etc. The present study was designed with the following objectives, to study the effect of -

1. Child related variables on child's cognitive development.

2. Parent related variables on child's Cognitive development.

3. School related variables on child's Cognitive development.
THE SPECIFIC OBJECTIVES OF THE STUDY WERE AS FOLLOWS:

1. (i) To study the effect of age on child's cognitive development.
   (ii) To study the effect of sex on child's cognitive development.
   (iii) To study the role of intelligence on child's cognitive development.

2. (i) To study the effect of socio-economic status of the parents on child's cognitive development.
   (ii) To study the effect of parental interaction on child's cognitive development.
   (iii) To study the effect of parental behavior on child's cognitive development.
   (iv) To study the effect of facilities provided at home on child's cognitive development.

3. (i) To study the effect of school environment on child's cognitive development.
   (ii) To study the effect of method of teaching on child's cognitive development.
   (iii) To study the effect of teacher's interaction on child's cognitive development in school.
(iv) To study the effect of facilities for play in school on child's cognitive development.

1.5 DEFINITION AND EXPLANATION OF THE TERMS USED IN THE STUDY

Various terms used in the study have been operationalised in the following manner:

1. Cognitive Development: Cognitive is a general term covering various modes of intellect such as knowing, perceiving, remembering, imagining conceiving, judging reasoning etc. All these mental operations are reflected in the usual behavior of human being. But in the present study the term cognitive development has been adopted from Piaget. According to him upto 2 years of age cognition is perception, from 2 to 7 years cognition marks the beginning of organised language, symbolic functions, logical thinking but lack of co-ordinating ability, from 7-11 years cognition represents development of conservation of number, substance, length, area, weight and reversibility. From 11 years onwards cognition is marked by the appearance of hypothetical and deductive reasoning in child.

2. Cognitive Period: Cognitive period indicates that every child manifests mental development by passage through four successive periods according to Piaget. These periods are Sensori motor (0-2 years), Pre-operational (2-7 years), Concrete operational (7-11 years), and Formal operational (11 plus). The term cognitive period has been used in the same way as described by Piaget.
3. **Concrete Operation** : The third of Piaget's four stages of cognitive development. It is a time when children can think logically but only about something concrete. They are still incapable of abstract hypothetical thought.

4. **Conservation** : A specific development in children's thinking in the period of concrete operational stages of development, when they realize that a substance retain certain basic features even when its form changed.

5. **Conservation Tasks** : Task in fact means the experimental conditions which specifically demonstrate the "concept". It is a condition of experimental control in which, out of two equivalent, one is deformed or transformed. If transformation distracts the elicitation of a correct response the child was regarded to be non conserver. Task therefore practically manifest the behavior related to one's concept. Here all task provide an experimental condition for observing the subject's cognitive ability.

6. **Conservation of Number** : Conservation of number indicates that, the numerical equality between two collection of subjects remain unchanged following a change in the spatial arrangement of the object, provided no objects are added or taken away.

7. **Conservation of Length** : Conservation of length means a change in the position, arrangement or shape will not increase or decrease its length, until and unless something is added or subtracted from the original material.

8. **Conservation of Weight** : Conservation of weight means a change in shape of an object will not alter its weight until something is added or subtracted from it.
9. **Conservation of Area**: Conservation of area means a change in the arrangement of the parts of an object will not alter its total surface area i.e., the total surface area of the parts of an object is equal until and unless something is added or subtracted from it.

10. **Conserver**: Children who give answers based on reversibility of thought, able to apply their logical thought and explain fully their responses with reason were termed as conserver.

11. **Non-Conserver**: Children whose thinking are dominated by perceptual centering on the single dimensions, non-sense explanation for their responses are regarded as non conserver.

12. **Transitional**: Children who give uncertain answer and the reason given by them for their explanation is not based on proper logic are regarded as transitional.

13. **Identity**: Identity indicates to realise the identical nature of the two objects shown to the subject in conservation experiment.

14. **Prediction**: Prediction indicates to predict if one object is deformed then both the object would be remain same or not.

15. **Judgement**: Judgement means whether there are "more" or "less" of the two object after making deformation.

16. **Explanation**: To explain about the response made by the subject in judging the question asked to them.

17. **Socio-Educational Variables**: Socio-educational variables include the child related variables like age, sex and intelligence, parent
related variables like socio-economic status of parents, parental behavior, parent child interaction and facilities provided at home, school related variables like school environment, teacher student interaction, method of teaching and facilities for play in school which influence the cognitive development of children.

18. Socio-Economic Status: Being a composite variable Socio-Economic Status includes a total SES scores based on father's educational level, occupation and income. The educational level ranged from post graduate to below primary level occupation, from higher professionals to unskilled labourer, and income from above rupees 5001 to rupees 501. The Socio-Economic Status here indicates the position that a family occupies by means of income, education and occupation of the head of the family.

19. High and Low Interactive Parent Groups: Those parents who interact mostly with their children such as getting them toys narrating stories to them, allowing them to participate during meal time conversation helping in performing extra curricular activities are regarded as high interactive parent group and those who interact poorly with their children in those areas are regarded as low interactive group parent.

20. Dominating and Considerate parents: Dominating group of parents are those who are very strict in disciplining their child and granting permission, too much anxious about their child's education, health, future career, daily activities etc. Considerate parents are those who are liberal in the above situations.
21. **Facilities at home**: Facilities at home indicates the availability of play facilities, toys, separate room for study, study materials encouragement from adults etc. The higher score indicates having good facilities and lower score indicates poor facilities.

22. **School environment**: School environment comprises of the facilities of school like accommodation adequacy of teaching materials, equipment, faculty members, provision for extra curricular activities etc. The higher score indicates having good environment and lower score indicates having poor environment.

23. **High and Low Interactive Teachers**: High interactive teacher groups are those who scored higher in the dimension of their relationship with the students, encouraging them in doing their extra curricular activities, playing with them, narrating stories to them etc. and low interactive teacher group are those whose score was less in the above dimensions.

24. **Good and Poor Methods Of Teaching**: Method of teaching includes using illustrative materials, adopting different activities like oral, written, visual, using models, diagrams, equipments etc. in teaching science. The higher score indicates having good facilities, lower score indicates having poor facilities.

25. **Private School**: These schools are managed by Private bodies. These schools draw students largely from both upper class and middle class background and assure good standard of education. These schools are more competitive than other schools. Medium of instruction is English.
26. **Government School**: These schools are run by government and syllabus is prescribed by the State Board of Education. These schools largely draw students from the lower middle class and lower class background. Medium of instruction is mother tongue.

1.6 **DELIMITATION OF THE PRESENT STUDY**: The present study is limited in terms of sample, geographical situation and content. The specification of such delimitation measures are given below:

1. The population of the study comprises the children of primary school of age group 6-10 years. Hence the conclusions are not to be extended beyond the population sample taken into consideration.

2. The samples were selected from seven schools of greater Guwahati area of Assam where the school administration extended their helping hand to carry out the study.

3. The present study is specially designed to study the developmental ability to conserve the concept of number, length, weight and area in relation to some variables which are the main factors of concrete operational stages as described by Piaget. This study is not meant to find out the factors responsible for that kind of development.