CHAPTER – I

THE PROBLEM

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CHAPTER - I

INTRODUCTION

1.1 INTRODUCTION:

Intelligence plays an important role in one’s academic, professional, social and personal life. It is because of this reason that parents, teachers and employing organizations have always been concerned with the problems of measuring intelligence. Earlier primitive man employed crude methods of measuring intelligence by means of physical strength and solving puzzle. With the advancement of civilization and development of scientific enquiry the methods of measuring intelligence were also improved. Many psychologists and educators developed various kinds of tools like scales and tests to measure intelligence of children. With the help of these scales, IQ of children of different age-group can be measured.

The use of intelligence tests has greatly increased in these days. The fact is due to wide individual differences that exist among individuals with regard to intelligence. Truly speaking, no two individuals, even identical twins or individuals nurtured in identical environments, are endowed with equal mental energy. The assessment of intelligence by various tests has given reasons enough to believe that not only does intelligence vary from individual to individual, but it also tends to vary in the same individual from age to age and
situation to situation. The intelligence of an individual can be observed only to the extent that he manifests it in one or more intelligence tests.

Intelligence tests have had very extensive use in educational classification, selection and planning from the first grade through the university. When intelligence tests are used to determine an individual’s intellectual abilities, the purpose is to provide educational and vocational guidance. In business and industry, tests are helpful in selecting and classifying personnel for placement in jobs that range from the simpler semiskilled to the highly skilled, from the selection of filling clerks and salespersons to top management. For any of these positions, however, tests results are only one source of information.

As uses of Intelligence Tests are manifold, many intelligence tests have been constructed and standardized by researchers of our country from time to time. But, India being a country of multi-lingua and diverse cultures, intelligence tests prepared and constructed in the country were found to have developed for their own specific needs, culture and languages of a particular state and region. Meghalaya being one of the states of India also practices its own distinct culture and language. So, tests prepared by other researchers of the country were not suitable to the Khasi children of the state in terms of item, content and language. Based on this ground the present test was developed.

1.2 PROFILE OF MEGHALAYA:

Meghalaya is one of the seven sister states in the North East India. The state was inaugurated as an autonomous state within Assam on 2nd April 1971. It was declared a state of Indian Union on January 21st 1972, with Shillong as its capital. Meghalaya primarily
consists of three ranges- the Khasi, Jaintia and Garo, named after the tribes who are its predominant inhabitants. The unique common trait of all the three major tribes is matrilineal. Administratively Meghalaya consists of seven Districts namely, East Garo Hills, West Garo Hills, Jaintia Hills, East Khasi Hills, West Khasi Hills, Ri-bhoi and South Garo Hills, together with three Autonomous Districts Councils.

The state has an area of 22,429 sq.km. It extends for about 300 Km in length and about 100 Km in breadth, bounded by Assam on the north and East and on the South and West by Bangladesh. The total population of the state according to the Census 2001, was 23,18,822, with 11,76,087 males and 11,42,735 females. Population density is 103 per square kilometre. The Schedule Tribes constitute 85.94 % and the Schedule Castes and others 14.6% that is 11,139.

In fact the inhabitants of Meghalaya are the Pnars, the Bhois, the Wars, the Lyngngams, the Khynriams and the Achiks (Garos). Other than these, the state is also the home of various minor tribes like the Rabhas, Koch, Migos, Nagas, Mikirs and Hajongs having their own linguistic and cultural identities. Besides these, there are other communities, like the Bengalese, Assamese, Nepalese, Manipuri, Biharis, and Punjabis etc. who are mostly confined in the urban areas. The main languages spoken by the majority of the population in Meghalaya are Khasi, Pnar and Garo, with English as the official language of the state. The medium of instruction in educational institutions is English, except at the primary school stage where mother tongue is the medium of instruction.

The education system in Meghalaya was nurtured by the Christian missionaries, though, during the British Raj, its progress was very slow. Educational development mainly started after independence when the number of schools began to multiply gradually. The
progress of education was further enhanced with the launching of the First-Fie Year plan, and the state and central government’s efforts to fulfil the aims enshrined in the Constitution of India.

When Meghalaya attained its statehood, the system of education followed then was that of pre-independence days with the Director of Public Instruction at the helm of affairs in the Directorate of Public Instruction within the Department of Education. With the trifurcation of the erstwhile Directorate of Public Instruction (DPI) in 1997 the restructured Directorate now has three separate Directorates within the Department of Education each with powers, functions and jurisdictions as notified by the state government. The Directorate of Elementary & Mass Education (DEME) is to look after elementary school education: the Directorate of Higher & Technical Education (DHTE) to look after secondary, higher secondary school education, college and technical education: and the Directorate of Educational Research & Training (DERT) to look after teacher education. The state follows the National pattern of education of 10 + 2 + 3. The system was introduced in 1994 under the Meghalaya Board of School Education (MBOSE).

In recent years, Meghalaya has developed significantly in the educational sector leading to more opportunities to the students of North East region as well to the other parts of the country. It has many colleges offering various degrees as well as professional courses. Most of the colleges are affiliated to the North Eastern Hill University. Some of the famous colleges are Saint Mary’s college, Saint Edmund’s college, Saint Anthony’s college, Lady Keane and Shillong College. The establishment of the North Eastern Indira Gandhi Regional Institute of Health and Medical Science (NEIGRHS) in the state has attracted more students from outside. At present the state has three universities, four Teachers’ Training colleges,
one polytechnic one Engineering institute, two Law colleges, and more than 55 colleges offering Arts, Science and Commerce education, and 711 High and Higher Secondary schools, 1759 middle schools, and 5851 primary schools. The free and compulsory elementary education till the age of 14 years has added to the increasing rate of literacy (according to the 2001 census is 63.31% approximately) and also to the educational development.

Though, the literacy rate of the state is far from satisfactory, the general education provided by its different institutions still attracts lots of students from our neighbouring states. But to be at par with other advanced states, it still has a lot more to achieve in the field of science and technology, research and development. More contributory studies should be conducted and tests, instruments and measurements should be developed. As of now, the state is still far behind in those areas. Till today, the state does not have a single psychological test of its own that can measure the general ability, aptitude, personality etc. of the school or college students. So far no single study has been carried out in this field.

1.3 NEED AND JUSTIFICATION OF THE STUDY:

Shillong the capital of Meghalaya in North-East India has always been the hub of educational prospects in the region, where students of different backgrounds and different socio-economic status flock in to receive the best education, which different institutions of the state provide. So, the capital of the state has become the home of many communities. This has lead to the increased educational competitions and challenges amongst the Khasi students and outsiders. As the world is also becoming more and more advanced and complex; educational performance and achievement amongst students have also become
more and more difficult. The teachers and parents are often confused, curious and talked about the differences in the educational performance and academic achievement of the school going children; as most of them believe that intelligence is one of the main determinants in the student's success and failure. It is this phenomenon which has encouraged the investigator to study the intelligence of the Khasi School going children of the state. In fact, if a child's potential or talent could be measured, estimated or at least identified before he enters into a course of training or discipline, much wasted efforts could be spared. The measurement or identification of intelligence and other mental abilities is very crucial at all stages and it can be checked and examined by intelligence test. A good intelligence test may contribute to the improvement of education. Tests of abilities and other personal characteristics play a large role in modern life, contributing to countless decisions that shape individual's upbringing, schooling and careers.

Seeing the importance of intelligence of students and the necessity of intelligence tests as a measuring tool, the investigator feels that it is important to have a separate intelligence test to measure the general mental ability of the Khasi school-going children. As of now the state does not have a single psychological tool of its own to assess the general mental abilities of the children. Even though there are many intelligence tests that have been constructed and standardized by researchers of our country from time to time, they were found not suitable for Khasi children in terms of content and language.

The investigator therefore, decided to construct and standardize a verbal group test of intelligence in the Khasi language for the Khasi school-going children on the following grounds:
1. Intelligence Tests prepared for children of other states are not suitable in terms of the content and language of Khasi children.

2. So far no test has been constructed and standardized in the Khasi language for Khasi children of the State of Meghalaya.

3. No intelligence test is available with the local norms

1.4 **NATURE OF INTELLIGENCE:**

Intelligence is a term which is so commonly used and yet rather difficult to define in a precise and generally accepted form. This difficulty of definition is perhaps not because of our lack of information about it, but, because in recent years, psychologists have gathered so much materials about it by the use of intelligence tests that we find it difficult to adapt a simple and comprehensive meaning of the term. Aggarwal (2002)\(^1\) quoted Ballad’s observation, “While teacher tried to cultivate intelligence and the psychologist tried to measure intelligence nobody seems to know what intelligence was”. To understand the meaning and nature of intelligence, it is worthwhile to quote some of the important definitions and discuss the various theories as follows:

The term ‘Intelligence’ comes from a Latin Word ‘Intelligentia’ coined by Cicero\(^2\) to translate a Greek word used by Aristotle to cover all cognitive processes. It was assumed that this capacity of cognition was something inherent in human nature (and possibly in animals). It was recognized that every man was born with a general cognitive capacity which was conveniently termed Intelligence. Spencer regarded intelligence as a capacity of

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\(^2\) J.D. Boaz: *General Psychology*, Published by the Author, Madras. 1957, p. 179.
the organism to adjust itself to an increasingly complex environment. This view was shared by a number of biologists who were agreed that intelligence was an innate capacity. Galton put forward the view in line with the traditional faculty theory that there was a kind of super faculty called the general cognitive ability. From this general ability he distinguished special abilities like memory and imagination. Galton sometimes used the term intelligence for this general cognitive ability. This distinction of Galton was accepted by Binet.

Binet (1916) viewed intelligence as the ability, ‘to judge well, to understand well, and to reason well.’ He believed that intelligence projects itself in several ways. According to Terman (1921) ‘An individual is intelligent in proportion as he is able to carry on abstract thinking’. As per Spearman’s (1923) definition ‘Intelligence is the analytic and synthetic ability of mind’. While to Thorndike (1923) ‘Intelligence is power of good responses from the point of view of truth and fact’. Wagnon (1937) defined, ‘Intelligence is the capacity to learn and adjust to relatively new and changing conditions.’

To Stoddard (1943) intelligence is ‘The ability to undertake activities that are difficult, complex and abstract and which are adaptive to a goal, and are done quickly and which have social value and which lead to the creation of something new and different.’ Wechsler (1944) gave a comprehensive definition, ‘Intelligence is the global or aggregate capacity of an individual to act purposively, to think rationally and to deal effectively with his environment.’ Burt (1946) defined, ‘Intelligence is all round innate mental ability. It is a power of readjustment in novel situation by organisation of new psycho-physical combination.’ According to Piaget (1952), ‘Intelligence is the ability to adapt to one’s surroundings’.
Vernon (1960) perceives intelligence as: ‘all round thinking capacity or mental efficiency’. Cattell (1963): considers that intelligence is composed of two components which he describes as fluid (Gf) and crystallized (Gc). Fluid intelligence represents the influence of biological factors on intellectual development and is thought to be comparable to inherited ability. Crystallized intelligence is the outcome of the skills and concepts which have become established through cultural pressure, education and experience’ Heim’s (1970) definition of intelligent activity ‘as consisting of grasping the essentials in a given situation and responding appropriately to them’.

Sternberg (1986) defined ‘intelligence as the mental capacities to automatise information processing and to emit contextually appropriate behaviour in response to novelty.’ Bruno (1986) viewed, ‘Intelligence is usually associated with the abilities to learn quickly, to adapt to new situation, to use abstract reasoning, to understand both verbal and mathematical concepts and to perform the tasks in which relationship is grasped’. According to Gardner (1993), ‘Intelligence is the ability or skill to solve problems or to fashion products which are valued within one or more cultural settings.’ Schank & Birnbam (1994) say ‘what makes someone intelligence is what he/she knows.’ According to a report of Task Force convened by the American Psychological Association in 1995, “Mainstream Science on Intelligence” signed by 52 intelligence researchers 1994, “A very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a

4 http://en.wikipedia.org/
broader and deeper capability for comprehending our surroundings-"catching on", "making sense" of things, or "figuring out" what to do". Another simple and efficient definition is, "The ability to apply knowledge in order to perform better in an environment".

As to Perkins (1995)\(^5\), 'We can become more intelligent through study and practice, through access to appropriate tools, and through learning to make effective use of these tools.'

While to Simonton (2003)\(^6\), "...intelligence is a set of cognitive capacities that enable an individual to adapt and thrive in any given environment they find themselves in, and these cognitive capacities include things like memory and retrieval, and problem solving and so on so forth. There is a cluster of cognitive abilities that lead to a wide range of environments."

According to the Encyclopaedia Britannica (2006)\(^7\), "Intelligence is the ability to adapt effectively to the environment, either by changing the environment or finding a new one ....Intelligence is not a single mental process, but rather a combination of many mental processes directed toward effective adaptation to the environment"

Though, there were many definitions mentioned above, but the terminology and language used by different psychologists in defining intelligence, seems to have agreed on the following:

➢ Intelligence must be understood as the mental capacity or mental energy available within an individual at a particular time in a particular situation.

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\(^5\) [ht://otec.uoregon.edu/intelligence.htm](ht://otec.uoregon.edu/intelligence.htm) # Perkins
\(^6\) [www.indiana.edu](www.indiana.edu). (Simonton, Personal communication, July, 5, 2003).
\(^7\) [www.vetta.org/shane/intelligence ehtml](www.vetta.org/shane/intelligence ehtml)
This, mental capacity helps him in the task of theoretical as well as practical manipulation of things, objects or events present in his environment in order to adapt to or face new challenges and problems of life as successful as possible.

His capacity or the fund of mental energy available with him can be judged only in terms of the quality of his behaviour or performance.

Intelligence is an umbrella term used to describe a property of the mind that encompasses many related abilities, such as the capacities to reason, to plan, to solve problems, to think abstractly, to comprehend ideas, to use language, to learn and to adapt effectively to the environment.

The nature of intelligence can be properly understood by explaining its different theories. From time to time psychologists have propagated different theories trying to uncover the components or elements of intelligence. Galton, influenced by his cousin Darwin, was the first to advance a theory of general intelligence. For Galton, intelligence was a real faculty with a biological basis that could be studied by measuring times to certain cognitive tasks. Galton’s research on measuring the head size of British scientists and ordinary citizens led to the conclusion that head size had no relationship with the person’s intelligence.

The present study classified the theories of intelligence into Factor theories and Cognitive theories as follows:
A. Factor Theories of Intelligence:

Factor Theories are those theories which employed factor analysis techniques for identification of factors or commons abilities which constitute one’s intelligence. These theories exhibit wide variations in terms of the number of factors that they consider important. The range of such factors goes from 1 (monarchic theory) to 150 (Guilford’s intellect model). Following are the factor theories:

(i) Binet’s Uni-factor Theory (1904):

The theory was originally developed by Binet and was supported by Stern, Terman, and Ebbinghouse. The supporters of the theory considered intelligence as a faculty which affects all the mental activities. According to this theory if a person is proficient in one area, he should be proficient in other areas as well. Hence the originator of this theory tried to prove that intelligence can be defined as ‘unifactor’. It is on this basis that intelligence is defined by Binet as ‘ability to reason’, by Terman as ‘ability to think’ and by Stern as ‘ability to adjust to the new circumstances’.

The ideas propagated by this theory are not however born out in real-life situations. It may be seen for instance that a child who is good in mathematics may not despite genuine interest and diligence be able to do as well in civics while an above average performer in the laboratory may not exhibit comparable competence in learning a language. This goes to show that intelligence is not just a unitary factor and the unitary theory is therefore not acceptable.

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8 NCERT, op.cit.
(ii) Spearman's Two-factor Theory (1905):

According to this theory, intelligence is made up of a general factor (or 'g' factor) and several specific factors (s₁, s₂, s₃, s₄ ...). The 'g' factor is common to all individuals and is present in all mental activities. It defined the g factor as a mental energy that is required in all mental tasks that individuals possess in varying degrees (because people differ in their mental activity). The s factors are specific to particular tasks. Thus different tasks may require different s factors. Such a factor is unique to the activity itself. The 's' factor require for arithmetic is not the same as those required for reading and spelling. As 's' factors vary from task to task; it also differs from individual to individual. Thus two students may have a high level of general intelligence. But one student may be less capable in arithmetic than the other who has high s factor required for arithmetic. Usually persons having high general intelligence have more s factors at their command, but these are exceptions. This is why a person with above average (or below average) general intelligence tend to be above average (or below average) in most thing they do. Spearman⁹ proposed that the aim of any intelligence test should be to measure the amount of 'g' factor of each person because it provides the most important basis of predicting a person's behaviour in different situations. It is relatively of little use to measure the s factor because it is unique to a specific activity.

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The theory has been criticized on the grounds that intelligence may be expressed in terms of two factors, as have said above, but there are not only two but several factors (g., $s_1, s_2, s_3, s_4$). According to Spearman, each job requires some specific ability. This view was untenable as it implied that there is nothing common to different jobs except a general factor and professions such as those of nurses, compounders and doctors could not be put in one group. They overlap and give rise to certain common factors.

(iii) Thorndike’s Theory of Neural Connections (1914):

Thorndike differed sharply with Spearman by asserting that there are no such things as general intelligence or general mental ability. Thorndike’s theory was more of an abstract one. His theory is based on the idea that intelligence is due to the number and kind of neural connections. Thus a bright person has more neural connections of an adequate nature than a dull person. According to him every mental act is different from the other. But there are
common elements in all mental acts. Based on these common elements he identified three components of intelligence such as: (a) concrete thinking (the ability to deal with things) (b) social thinking (the ability to deal with people) and (c) abstract thinking (the ability to deal with ideas).

Thorndike’s theory has been criticized as placing too much emphasis upon the fact that a person’s degree of observable behaviour depends upon the number of connections in the brain and nervous system as a *sine qua non* of his intellectual activities. The theory would seem to make no provision for flexibility in the whole pattern of intellectual life.\(^{10}\)

(iv) *Thurstone’s Group Factor Theory (1938):*

According to this theory intelligence activity is not an expression of innumerable highly specific factors as Thorndike claimed. Nor is it the expression primarily of a general factor that pervades all mental activity and is the essence of intelligence as Spearman held. Instead the analyses and interpretations of Thurstone and others led to the conclusion that certain mental operations have in common a ‘primary’ factor that gives the psychological and functional unity and that differentiates them from other mental operations. These mental operations then constitute a ‘group’. A second group of mental operations has its own unifying primary factor; a third group has a third; and so on. In other words there are a number of groups of mental abilities (the number being as yet undetermined) each of which has its own primary factor giving the group a functional unity and cohesiveness. Each of these primary factors is said to be relatively independent of the others. Thurstone and his

collaborators concluded that six primary factors emerged enough for identification and use in test design and construction. They are as follows:

(i) *Number factor* (*N*)- ability to do numerical calculations rapidly and accurately

(ii) *Verbal factor* (*V*)- found in tests involving verbal comprehensions

(iii) *Space factor* (*S*)- involved in any tasks in which the subject manipulates an object imaginably in space.

(iv) *Word fluency* (*W*)- involved whenever the subject is asked to think of isolated words as at rapid rate.

(v) *Reasoning factor* (*R*)- found in tasks that require the subject to discover a rule or principle involved in series or groups of letters

(vi) *Rote memory factor* (*M*)- involving the ability to memories quickly.

\[ P_1 = \text{Verbal ability} \]
\[ P_2 = \text{Numerical ability} \]
\[ P_3 = \text{Reasoning ability} \]
\[ P_4 = \text{Memory} \]
\[ P_5 = \text{Spatial ability} \]
\[ P_6 = \text{Word fluency} \]

Fig.1.2: Thurstone’s Group factor theory of intelligence

Although primary mental abilities (or factors) were originally said to be functionally independent of each other it was found that they are positively and significantly intercorrelated.
The theory has been criticized on the ground, that some studies show a positive relationship among these abilities. Thus a person who is average (or above or below) in one ability is usually average (or above or below) in the others. This is evident to suggest that different types of mental activities share something in common and that they may all be influenced in part by general intellectual ability.

**(v) Thompson's Sampling Theory (1939):**

The theory propagated by Thompson assumes that the mind is made up of several independent bonds or elements. Any specific test or school activity samples some of those bonds. It is possible that two or more tests sample and utilize the same bonds, and a general common factor can be said to exist among them. It also possible that some other tests sample different bonds, in which case the tests have nothing in common and each of them is specific.

The sampling theory combines several theoretical viewpoints in that, as it appears to be similar to Thorndike's multifactor theory except that he concedes to the practical usefulness of a concept like 'g', and at the same time Thompson seems to maintain that the concept of a group factor (G) is of equal practical usefulness.
(vi) **Vernon's and Burt's Hierarchical theory (1950):**

Vernon & Burt suggested a hierarchical structure for the organization of intelligence. According to them, the mind is a kind of hierarchy in which ‘G’, is the most prominent mental ability, i.e. an overall factor measured through intelligence tests. Under ‘G’, there are two major group factors: (i) Practical Ability and (ii) Academic Ability. Further division of factor takes place at next step. Practical ability is divided into- perceptual, mechanical and spatial ability, while academic ability is divided into reasoning, numerical and verbal ability. These major factors can be divided into minor group factors and ultimately these minor factors may be further sub-divided into various specific factors related with minute specific mental abilities. The theory is propounded on the basis of factor analysis approach\(^\text{11}\).

(vii) **Guildford's Structure of Intellect Model (1967):**

Guildford and his associates defined Intelligence on the basis of structural considerations of discrete factors. On the basis of his factor-analytic research of nearly 20 years, Guildford (1967)\(^{12}\) has proposed a three-dimensional box-like model which he calls the *structure of intellect model or SI model*. The model has tried to simplify the picture of intellectual trait relationships by organizing the traits along three dimensions viz. contents, operations and products. Each of these aspects of intelligence were analyzed and separated into subcategories: five for operations, six for products and five for contents, making a cube of 5X6X5=150 cells. A description of these three categories and sub-categories is given below:

(i) **Operations**: It refers to the basic intellectual processes of thinking used by persons. It has five subcategories: *Cognition, Memory, Divergent Production, Evaluation and Convergent Production*.

(ii) **Content**: It refers to a type of content or material on which operations are performed, that is, terms in which the person think. It has five categories: *Visual, Auditory, Symbolic, Semantic and Behavioural*

(iii) **Products**: It refers to the results of performing operations on contents, that is, the form of thought produced by individuals. It has six categories: *Units, Classes, Relations, Systems, Transformation and Implications*

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![Fig.1.5: Guilford’s Structure of Intellect Model](image-url)
Thus, the factor theories of intelligence try to throw light on the structure of intelligence by pointing out the number of its constituents or factors, e.g. the unitary theory holds that intelligence consists of only one factor, quite contrary to this, the multi-factor theory or theory of neural connections considers intelligence to be a combination of numerous separate elements or factors. Spearman’s two factor theory advocates the presence of two-factors- general intelligence ‘g’ and specific intelligence ‘s’. The group factor theory postulates that all intellectual tasks can be categorized in definite groups i.e. six such group factors. Vernon suggested a hierarchical structure for the organization of intelligence in the shape of G, an overall factor branching into two major group factors and various specific factors. Guilford’s theory lays down a model of the intellect involving three interrelated and interacted basic parameters - operations, contents and products for explaining the structure of human intelligence.

B. Cognitive Theories of Intelligence:

Cognitive theories analysed and described intelligence in terms of certain fundamental cognitive processes which are as follows:

(i) Piaget’s Stages of Intellectual Development Theory (1952):

Piaget defined intelligence as the ability to adjust, adapt or deal efficiently with one’s environment. Intelligence changes and develops as the organism matures biologically and as it gains from experience. As the child grows, he learns to adapt to the world around him. This adaptation becomes possible through two ways: assimilation and accommodation. By assimilation Piaget refers to a kind of matching between the already existing cognitive
structures and the environmental needs as they arise; and accommodation, he refers to an adjustment to new ways of thinking and behaving in place of assimilating or behaving in the same old fashion. Cognitive development, like all other development is a continuous process. Piaget divides cognitive development into four broad periods or stages which are as follows:\(^{13}\):

**i The Sensorimotor Stage: (from birth to 1\(\frac{1}{2}\) years):**

At this stage the child creates his own individual world which is connected with the satisfaction of his physical wants and its scope lies in the immediate sensation. During the last months of this phase the child begins to think about his experiences. He begins to gain some consciousness about objects and he also begins to gain some understanding regarding their stability. This is the period when he begins to develop some notion of object permanence. He starts comprehending casually, understanding of the principles that events can be caused. This sets the stage for later cognitive development. On the whole during this period, he remains confused regarding himself and his environment.

**ii The Pre-operational Stage: (from 1\(\frac{1}{2}\) to 7 years):**

At this stage, the child develops ways of representing events and objects through symbols, including the verbal symbols of language. The child’s language development takes place; this provides him with a good tool for thinking. He can now think about things that are not immediately present and he can begin to solve certain types of problems, particularly

\(^{13}\) J.C. Aggarwal: *Essentials of Educational Psychology*, Vikas Publishing House Pvt. Ltd., New Delhi, 2002, p.325
based on visual items, but cannot be related to abstract concepts, or items that are not apparent.

This stage is further sub-divided into (a) the pre-conceptual phase (approximately two to four years) and (b) the intuitive-phase (approximately four to seven years) which are discussed as follows:

(a) The pre-conceptual phase (approximately two to four years):

In the early part of this stage, the children seem to identify objects by their names and put them in certain classes. However, they usually make mistake in this process of identification and concept formation. Their mode of thinking and reasoning is quite illogical at this stage. Their thinking is sometimes too imaginative and far removed from reality. The intellectual structure of the child at this stage is concerned with his egocentric nature. By egocentric, Piaget means that the child can see the world only from his own standpoint.

(b) The Intuitive-phase (Approximately Four to Seven Years):

At this stage the child progresses towards the formation of various concepts at a more advanced level. The child’s thinking at this stage is not logical and is full of contradictions. It is clearly reflected in the absence of the two main cognitive characteristics namely, the ability to reverse and the ability to see an object as permanent even though its length, width or shape changes.
iii The Concrete Operational Stage: (from 7 to 12 Years):

This stage shows marked development in the cognitive functioning of the child. The child now learns to deal with concepts and ideas that exist only in mental terms. His thinking becomes more logical and systematic. The child now develops the ability to conserve both in terms of quantity and number of objects. The thinking of the child is no longer rigid and irreversible. Now he is no longer ego-centric in his thinking. The child now develops the abilities to deal adequately with classes; he can classify objects, he can serialize things in order, and the number concepts also developed, but it all happens in a very simple concrete form. The child now learns to carry out rather complex operations or tackle problems as long as they are concrete and not abstract. In this way, the child reaches a satisfactory level in terms of intellectual development by his thinking becoming quite systematic and logical. However, what is done or thought by him at this stage is done purely on a concrete level.

iv The Formal Operational Stage: (from 12 onwards):

This stage begins at about the age of 12 and is consolidated during adolescence. But in some cases the stage may extend beyond the age of 16. Individual differences are greater during this stage than during other stages. At this stage the adolescent’s thought is flexible and effective. He can deal efficiently with the complex problems of reasoning. He can imagine the many possibilities of solving a problem in a very systematic and logical way. Unlike the concrete operational child whose thought is limited to concrete objects and events, the adolescent can deal with hypothetical propositions. The creative aspects in the adolescent are very much visible during this age not only in terms of concrete operations but also in terms of abstraction and pure imagination. At this stage, many adolescents may
appear to be very idealistic in their thinking, but Piaget said that the adolescent’s idealism is temporary. This false idealism will change during subsequent years when he will confront the real world. False idealism is a necessary prior development to realistic thought. At this stage, the adolescent also begins to think about himself, his role in life, his plans and the validity on his beliefs. In fact, Piaget was of the opinion that the thought processes and the intellectual functioning of a child at this stage reflect the beginning of the most advanced stage in the functioning of his cognitive system. According to Piaget, after the expiry of the formal operation stage the child may reach full intellectual potential.

Piaget’s theory on intellectual development has been questioned and challenged on the ground, that, Piaget’s views on the pattern of intellectual development are not as uniform and universal as claimed by him. He based his theory on detailed observations of European children as they grew up in 1920s, 1930s, and 1940s. The subsequent researches in Europe and outside have demonstrated significant deviations from the chronological ages linked different stages of intellectual development by Piaget. His view that thinking proceeds in distinct stages has also been seriously challenged. It has been found that cognitive performance at particular ages is usually very inconsistent.

(ii) Cattell’s and Horn’s Theory of Fluid and Crystallized Intelligence (1965, 1978):

The term ‘fluid’ and ‘crystallized’ intelligence was first introduced by Cattell. He distinguishes between two types of intelligence, i.e. fluid intelligence and crystallized intelligence. Although viewed as different and distinct, these two types of intelligence intermingle and interact to produce overall intelligence. Fluid intelligence is considered to be the mental capacity of an individual, which is required for learning and problem solving.
It is dependent on neurological development and is relatively free from the influences of education and culture. In other words, it is derived more from biological and genetic factors and is less influenced by training and experience. This type of intelligence is put to use when facing new and strange situations requiring adaptation, comprehension, reasoning, problem solving and identifying relationships etc. It reaches full development by the end of an individual’s adolescence.

Crystallized intelligence, on the other hand, is not a function of one’s neurological development and therefore is not innate or unlearned like fluid intelligence. Rather, it is specially learned and is, therefore, dependent on education and culture. It involves one’s acquired fund of general information consisting of knowledge and skills essential for performing different tasks in one’s day-to-day life. It can be identified through one’s fund of vocabulary, general knowledge of the world affairs, the knowledge of customs, traditions and rituals, manner of behaving in the society, handling of machines and tools, craftsmanship and art, computation and keeping of accounts and various other such tasks requiring knowledge, experience and practice.

Thus, while fluid intelligence is characterized by a relatively high degree of culture, education, experience and training-free performances in abstraction, thinking, reasoning and imagination, crystallized intelligence is known for its evolution through experience, training and interaction with one’s environment over a number of years. That is why it is found to continue to increase throughout one’s life span.
Jensen propounded the theory of mental functioning. According to this theory, the functioning of one’s mind depends upon the type and degree of intelligence one possesses. Jensen describes one’s intelligence as being composed of two types of abilities, viz., associative abilities and conceptual abilities. Associative intelligence includes one’s ability to remember, reproduce, identify, discriminate, synthesize, associate, assimilate, transfer, and apply etc. Such abilities are usually measured by means of intelligence tests items, or tasks involving free recall, recognition, serial learning, free and controlled associative learning, selection and discrimination, etc. Conceptual abilities, on the other hand, involve one’s ability to carry out higher order of thinking, reasoning, analyzing and the capacity of problem-solving. These abilities are measured through tasks and test items requiring the use of conceptual ability, abstract reasoning, and novelty of situation and methods as also analytical and divergent thinking. According to Jensen associative abilities relate to biological maturation and show little variation among social classes and races. Conceptual abilities, however, are dependent on education and culture and are therefore, responsible for the observed differences in conceptual reasoning and abilities among social classes and races.

This attribute of intelligence in an individual according to Jensen, is two-dimensional, having intellectual breadth and intellectual altitude. The former consists of the intellectual fund of general information, vocabulary, practice and skill of handling tools and machines, ways and manners of behaving in society, etc. It usually depends upon one’s

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interaction with one's environment. Thus, it is described as a function of one's learning, education and culture. It is similar to Cattell's concept of crystallized intelligence. The latter, depends more on innate and neurological factors than on learning, training and environmental influences. It imparts altitude to one's intellectual structure by involving the relatively high-level cognitive abilities like abstract and divergent thinking, logical reasoning, imagination and conceptualization, problem solving etc. A person's intelligence is thus said to be built up on the base provided by his intellectual breadth and height maintained by his intellectual altitude. How intelligently he will function in a given situation thus depends upon his innate basic abilities and the required mental functioning.

(iv) Campione and Brown's Theory of Intelligence (1979):

According to the psychologists Campione and Brown, one's intelligence is composed of a two-part system. The first part is a biologically based architectural system and the second, an environmentally influenced executive system. The architectural system works as a base for one's intellectual functioning. It includes such basic mental abilities as memory capacity, the rate of loss of memory, the ability of proper information processing, etc. The executive system works as a store-house of knowledge and information and is said to include the cognitive abilities like schemata, cognitive learning strategies and metacognition (i.e. the awareness of one's abilities to plan, evaluate and regulate learning). The executive system works on a higher level and is thus responsible for higher order mental functioning and the abilities comprising this system are dependent on training and experience. The abilities comprising the architectural system, on the other hand, are innate
and biological and are thus relatively independent of the education, culture and training influences.

(v) *Gardner's Theory of Multiple Intelligence (1983):*

This theory suggests that traditional psychometric views of intelligence are too limited. Gardner first outlined his theory in his 1983 book *Frames of Mind: The Theory of Multiple Intelligences*, where he suggested that all people have different kinds of "intelligences." He originally identified seven components of intelligence (Gardner, 1983)\(^\text{15}\). He argues that these intelligences are relatively distinct from each other and that each person has some level of each of these seven intelligences. More recently, he has added an eighth intelligence to his list (Educational Leadership, 1997) and has suggested the possible addition of a ninth known as "existentialist intelligence". In order to capture the full range of abilities and talents that people possess, Gardner suggests that people do not possess just one intellectual capacity, but have many different intelligences including musical, interpersonal, spatial-visual and linguistic intelligences. Table 1.1 lists the eight intelligences identified by Gardner. It provides some examples of the types of professionals who exhibit a high level of intelligence. The eight intelligences are listed in alphabetical order.

Gardner's theory has come under criticism from both psychologists and educators. The critics argue that Gardner's definition of intelligence is too broad, and that his eight different "intelligences" simply represent talents, personality traits and abilities. Gardner's theory also suffers from a lack of supporting empirical research.

\(^{15}\) [http://www.geocities.com/Athens/column/7568/gardner.html](http://www.geocities.com/Athens/column/7568/gardner.html)
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Intelligence</th>
<th>Examples</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bodily kinesthetic</td>
<td>Dancers, athletes, surgeons, crafts people</td>
<td>The ability to use one’s physical body well.</td>
</tr>
<tr>
<td>2</td>
<td>Interpersonal</td>
<td>Sales people, teachers, clinicians, politicians, religious leaders</td>
<td>The ability to sense other’s feelings and be in tune with others.</td>
</tr>
<tr>
<td>3</td>
<td>Intrapersonal</td>
<td>People who have good insight into themselves and make effective use of their other intelligences</td>
<td>Self-awareness. The ability to know your own body and mind.</td>
</tr>
<tr>
<td>4</td>
<td>Linguistic</td>
<td>Poets, writers, orators, communicators</td>
<td>The ability to communicate well, perhaps both orally and in writing, perhaps in several languages.</td>
</tr>
<tr>
<td>5</td>
<td>Logical-mathematical</td>
<td>Mathematicians, logicians</td>
<td>The ability to learn higher mathematics. The ability to handle complex logical arguments.</td>
</tr>
<tr>
<td>6</td>
<td>Musical</td>
<td>Musicians, composers</td>
<td>The ability to learn, performs, and composes music.</td>
</tr>
<tr>
<td>7</td>
<td>Naturalistic</td>
<td>Biologists, naturalists</td>
<td>The ability to understand different species, recognize patterns in nature, classify natural objects.</td>
</tr>
<tr>
<td>8</td>
<td>Spatial</td>
<td>Sailors navigating without modern navigational aids, surgeons, sculptors, painters</td>
<td>The ability to know where you are relative to fixed locations. The ability to accomplish tasks requiring three-dimensional visualization and placement of your hands or other parts of your body.</td>
</tr>
</tbody>
</table>
(vi) Sternberg’s Theory of Triarchic Function Intelligence (1985, 1988):

Triarchic theory of human intelligence takes a somewhat different track from that of Gardner. The theory attempts to link cognition to context through three parts or sub-theories, known as ‘Triarchic’.

First, according to this theory, intelligence serves three functions in real world contexts. The first, adaptation to the environment, refers to people’s changing to themselves in order to suit the environments in which they live. The second, shaping of environment, refers to people’s changing to their environment to suit themselves. And the third, selection of environments, refers to people’s choosing new environments when they are unable to make their environments work for them either through adaptation or shaping.

Second, according to the Triarchic theory, environments and the tasks we confront within them vary in terms of their familiarity. At one extreme, we have tasks within environments that are extremely novel and that we have never before encountered. At the other extreme we have tasks that are so familiar that we accomplish them almost without thinking. According to the Triarchic theory, the two levels of experience that is most relevant for assessing intelligence are the zones of relative novelty and of automatization.

Third, we apply certain cognitive process to tasks at various levels of experience in order to adapt to, shape and select environments. The Triarchic theory distinguishes among three types of information-process components-metacomponents, performance components, and knowledge acquisition components. Metacomponents are used to decide what to do, to monitor it while it is being done, and to evaluate what one has done after it is completed.

Performance components are used in the actual execution of a task. And knowledge acquisition components are used to learn how to perform a task in the first place. Metacomponents activate performance and knowledge-acquisition components, which in turn provide feedback to the metacomponents.

(vii) Carroll’s Three-Stratum Model of Cognitive Ability (1993):

Carroll presented three-stratum model of cognitive ability according to which, at the most general level, there is a g factor, responsible for stable differences in the performances on the wide variety of cognitively demanding tasks. At the next level (the broad spectrum), there are a number of areas of ability, which imply that the rank ordering of individual’s task performance will not be exactly the same across all cognitive tasks, but rather will show some clustering. The broad abilities in Carroll’s model include the following:\(^{17}\)

1. Fluid intelligence, 2. crystallized intelligence, 3. general memory ability, 4. broad visual perception, 5. broad auditory perception, 6. broad retrieval ability, and 7. broad cognitive speediness. Some people do well on the broad range of memory tasks and others do well on the broad range of tasks of cognitive speediness. These broad ability areas can be characterized in terms of number of more specific abilities (the narrow spectrum).

The narrow spectrum includes 1. induction, 2. language development, 3. memory span, 4. spatial relations, 5. sound discrimination, 6. word fluency, and 7. perceptual speed. According to Carroll, tests designed to measure g and the tests designed to measure more specific aspects of intelligence both have independent place. It is up to the researcher

\(^{17}\) http://reprints.nec.gov.pk
to choose the ability area in the hierarchy according to the purpose of testing rather than by personal preferences.

**(viii) Perkins's Three Components of Intelligence (1995):**

In his book titled 'Smart Schools', Perkins analyzes a number of different educational theories and approaches to education. His analysis is strongly supportive of Gardner's theory of multiple intelligences. Perkins' book contains extensive research-based evidence that education can be considerably improved by more explicit and appropriate teaching for transfer, focusing on higher-order cognitive skills, and the use of project-based learning.

Perkins (1995) examines a large number of research studies both on the measurement of IQ and of programs of study designed to increase IQ. He presents detailed arguments that IQ has three major components or dimensions.

1. Neural intelligence. This refers to the efficiency and precision of one's neurological system.
2. Experiential intelligence. This refers to one's accumulated knowledge and experience in different areas. It can be thought of as the accumulation of all of one's expertise.
3. Reflective intelligence. This refers to one's broad-based strategies for attacking problems, for learning, and for approaching intellectually challenging tasks. It includes attitudes that support persistence, systemization, and imagination. It includes self-monitoring and self-management.

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18 [http://otec.uoregon.education/intelligence.htm#Perkins](http://otec.uoregon.education/intelligence.htm#Perkins)
Moreover, there is general agreement that neural intelligence has a "use it or lose it" characteristic. It is clear that neural intelligence can be maintained and, indeed, increased, by use.

Experiential intelligence is based on years and years of accumulating knowledge and experience in both informal and formal learning environments. Such knowledge and experience can lead to a high level of expertise in one or more fields. People who live in "rich" learning environments have a significant intelligence advantage over people who grow up in less stimulating environments. Experiential intelligence can be increased by such environments.

Reflexive intelligence can be thought of as a control system that helps to make effective use of neural intelligence and experiential intelligence. A person can learn strategies that help to make more effective use of neural intelligence and experiential intelligence. The habits of mind included under reflexive intelligence can be learned and improved. Metacognition and other approaches to reflecting about one's cognitive processes can help.

In summary, it can be said that, the cognitive theories of intelligence tried to analyze and described intelligence in terms of certain fundamental cognitive processes, e.g. Cattell and Horn's theory state that intelligence is made up of two types of intelligence - fluid and crystallized intelligence. Jensen's theory of mental functioning, describes one's intelligence as composed of two types of abilities, i.e. associative abilities and conceptual abilities. Campione and Brown's theory suggests that intelligence includes a biologically based architectural system and an environmentally influenced executive system. Sternberg's theory explains the individual's cognitive or problem-solving behaviour. It outlines our
mental functioning as definite steps explaining what we do with information from time we perceive it till we finish using it to solve our problem. Gardner’s theory defines intelligence as a set of abilities, talents, or mental skills that permits an individual to solve problems or fashion products that are of consequence in a particular setting. The theory provides a comprehensive view of the human cognitive structure, believes that there are eight independent types of intelligence. Carroll presented three-stratum model of cognitive ability-g factor, the seven broad abilities, and the seven specific abilities, which imply that the rank ordering of individual’s task performance will not be exactly the same across all cognitive tasks, but rather will show some clustering. Perkins presents three major components or dimensions of intelligence - Neural intelligence, experiential intelligence, and Reflective intelligence.

Thus, the different conceptions of the nature of intelligence has challenged the thinking of educational psychologists, stimulating intensive study and research and have contributed to the development of a widely diversity of tasks for testing it.

1.5 BRIEF HISTORY OF INTELLIGENCE TESTING:

Among the first to investigate individual differences in mental ability was a British scientist Galton, who compared people based on their awards and accomplishments. This research convinced him that intelligence was inherited and led to further studies which involved evaluating individual differences and specificity of the senses, which have since been shown to correlate with academic success. He devised most of the simple tests and paved the way for the application of rating scale and questionnaire methods etc. One of his disciples, Pearson carried forward his work.
Cattell of America occupies a prominent position in the development of psychological testing. He used the term “mental test” in an article in 1890\(^{19}\). This article related to a series of tests which were being administered annually to college students in the efforts to determine their intellectual level. Cattell like Galton felt that a measure of intellectual function could be obtained through tests of sensory discrimination and reaction time. The early experiments of Wundt were all concerned with sensory discrimination and motor ability. His worthy pupil Cattell did much useful work in America.

To the French psychologist Binet, however, goes the credit of giving the world the first systematic intelligence tests. He and Simon found that tests of practical knowledge, memory, reasoning, vocabulary and problem solving were better predictors of school success than the sensory tests used by Galton. In 1905 Binet and his co-worker Simon, published the first scale for measurement of intelligence known as Binet - Simon scale. In 1908 Binet and Simon revised the scale, and it was the first Age-Scale which had created interests among the psychologists. The concept of Mental Age (MA) which gives a measure of the individual’s level of intellectual development was formulated by Binet and Simon in 1905 and was first used in the 1908 scale. In 1916 Terman brought out the Stanford Revision of the Binet-Simon scale which is known as the Stanford-Binet Scale and popularized the term ‘Intelligent Quotient’ (IQ), which has since then been found to be an extremely practical concept. In 1937 and 1960, the Stanford – Binet scale was revised by Merill and Terman. With the Binet-Simon scale as the basis, various revisions have been made from time to time by workers in the fields. Some of the most important revisions

include (a) Goddard’s Revision in 1911, (b) the Point Scale of Yerkes in 1915 and (c) Burt’s Revision in 1921. It is important to mention that Yerkes’ scale was the first ‘point scale’. Instead of giving scores in terms of mental age, it is given in terms of points in this scale.

The next development in the history of intelligence testing was the creation of a new measurement instrument by American Psychologist Wechsler. Dissatisfied with the limitations of the Stanford-Binet, he published his new intelligence test known as the Wechsler-Bellevue scale for children above 10 and adults. The scale was revised in 1955 and the new version was named as WAIS- Wechsler Adult Intelligence Scale. In 1949, he devised a scale for children known as Wechsler Intelligence Scale for Children aged 5-15. In 1967 he also developed a scale known as the Wechsler Pre-school and Primary Scale of Intelligence.

The application of intelligence tests in the field of army recruitment led to two very important developments, namely evolution of group test and performance tests. The first was born out of the urgent need for assessment of a large number of people in the shortest possible time, while the latter out of the need to find a workable and dependable tool of assessment for illiterate people and those who could not read English because of foreign origin. The two tests were developed by a group of psychologists, led by Yerkes. The most widely used of the Army Scales were the Army Alpha Test brought into use for the first time about the year 1937\textsuperscript{20}, and the Army Beta Test. The former test was for literates and the latter for illiterates. It consisted of a variety of pictures and diagram and the directions were given without the use of language. Soon after, the group tests were widely and successfully

used in the United States Army, psychologists started constructing group tests for their use in schools and colleges. The National Intelligence Test, developed by Terman and Yerkes was first used around 1920 to test school children. The Scholastic Aptitude Test (SAT) was introduced in 1926 to help colleges and universities screen prospective students.

A group of non-language tests not requiring the use of pencil and paper but rather requiring the manipulation of actual objects came to be designated as Performance Tests and work in the construction of such tests also proceeded simultaneously along with the other non-verbal tests and group tests. The Michigan Non-verbal series by Green, the Drawing Test by Goodenough and tests devised by Brown published in 1936 was followed by the Terman Group test and the Otis Self-administering Test of Mental Ability.

In detailing the history of intelligence tests, it has been seen how individual intelligence tests were supplemented by group intelligence tests and how the original verbal test technique had to be expanded by new techniques depending on non-verbal. In the series of non-verbal tests techniques were developed depending either on the use of paper and pencil, or objects, or simultaneously on both. The limitations of depending on single tests for the assessment of intelligence were recognized early in the history of their application and the use of a battery of tests comprising a number of individual tests came into general practice.

Historically, in India, Christian missionaries were the first to use psychological tests. Up to 1921 the missionaries who were engaged in educational work displayed interest in the construction and validation of some well known psychological tests. Amongst the Indians, It was Rice who first attempted the standardization of Binet-Simon in Urdu and Punjabi. Kamat in the thirties adapted the 1917 version of the test in Marathi and Kannada, Shukla in
the forties developed the Gujrati version. Professor Mahalanobis was the pioneer in developing group intelligence tests in Bengali. Subsequently, we have the tests developed by Lal, Jalota and Mohsin in Hindi. The first Indian doctorate in test construction- 'group test of intelligence in Gujrati' (1954) was awarded to Desai. Bhatia Standardized for the first time a battery of performance tests for school going children. By the forties tests construction had spread rapidly all over India. Menzel himself a missionary, published the first book on 'test and measurement', in India which is still widely used by students of psychology and education as their guide towards new type of tests. Following these pioneer works, numerous translations and adaptations in Bengali, Hindustani, Tamil, Telegu, Hindi and Urdu at various Training Colleges and universities by eminent educationists have been subsequently made. The prominent institutions and organizations in the field of testing are National Council of Educational Research and Training (NCERT) New Delhi, Department of Education, Delhi University/Central Institute of Education, University of Delhi., Department of education and Psychology of Indian Universities etc.

Intelligence testing remained for long the most popular pursuit. Harper\textsuperscript{21} observed in 1960 that in 1956, 40% of test development work in India related to intelligence. In the First Mental Measurement Handbook for India brought out by the NCERT, of the 326 tests on which abstracts and information had been provided, 100 were intelligence, 96 achievement, 60 aptitude, 45 personality, 15 interest and 10 were classified as 'miscellaneous'.

Intelligence testing is not free from criticisms like, measurement experts are unable to define intelligence in a way which satisfies everyone, and it is illogical to measure

something we cannot define. IQ tests assess abilities that are too narrow and tell nothing about creativity, motivation, honesty, friendly and other human traits and characteristics. IQ tests are only achievement tests that measure what the child has already learned, rather than his innate capacity to learn. It is not unusual for an individual’s IQ to show extreme fluctuation from one test administration to the next. The standardization sample fails to include all ethnic, racial, regional and socio-economic groups. IQ tests suffer from content bias that is related to inappropriate vocabulary that is not related to the purpose. Administrators do not ask for IQ scores for admission to schools and colleges or for employment purpose.

Even though intelligence tests suffer from criticisms, but they are indispensable tools of modern society. Intelligence tests are intended to help in: Selection of courses and careers, classification of pupils into homogeneous groups, diagnosing the causes of educational backwardness, predicting the future progress of the individual, selection and placement of candidates, giving educational guidance and counselling, for identifying the gifted children, for identifying the degree of mental retardation, for measuring general learning readiness, and for indicating individual differences in capacities of children of same chronological age.

1.6 STATEMENT OF THE PROBLEM:

The problem of the study was stated as follows:

“Construction and Standardization of Verbal Group Test of Intelligence in the Khasi language for School going children”.
1.7 OPERATIONAL DEFINITIONS OF THE TERMS USED:

The terms used in the title of the study were operationally defined as follows:

(i). Intelligence: “Intelligence is a general intellectual capacity which consists of the abilities: to reason well with abstract materials, to comprehend well, to have a clear direction of thought, to relate thinking with the attainment of a desirable end.

(ii). Intelligence Test: “Intelligence test is a standardized instrument which measures general mental abilities of an individual.”

(iii). Construction: “Construction of a test means writing of items and selection of items by means of items analysis”.

(iv). Standardization: “Standardization means preparing the uniform procedures in administering and scoring the test and establishing its reliability, validity and norms”.

1.8 OBJECTIVES OF THE STUDY:

The objectives of the study were as follows:

1. To construct a verbal group test of intelligence in the Khasi language for school going children of the age group 14 to 16+.

2. To standardize the test by establishing its reliability and validity.

3. To set up norms for the test

4. To develop a test manual

5. To study the level of intelligence of the Khasi children (age-wise) as obtained by the intelligence test constructed by the investigator.
1.9 DELIMITATION OF THE STUDY:

The study was delimited in the following ways:

1. The sample of the population is restricted only to the Khasi speaking school-going children of four districts of the state of Meghalaya viz.: East Khasi Hills, West Khasi Hills, Jaintia Hills and Ri-Bhoi District.

2. The test instrument is limited only to measure the intelligence of the Khasi students belonging to the age-group 14 to 16 + years studying in classes VIII to X.

3. The test items and instructions in the manual are prepared in the Khasi language. However, English version is also made available for the purpose of references only.

1.10 SCOPE OF THE STUDY:

Every educational institution needs standardized tests for effective identification, classification, and placement of its students and workers. It is true that almost all societies have their own standardized tests reflecting their own culture and language. As of now, there is no intelligence test available in the Khasi language, so the present study will serve the long felt need of the Khasi society of having its own verbal group test of intelligence in Khasi language reflecting the Khasi’s culture. The test will be of great help to the state administrators, educational researchers and teachers to assess the intelligence of the school going children of the state of Meghalaya. It will help them in selection and placement of candidates, classification and grouping of students according to their abilities and providing guidance services.

The test will also be of immense use for the Degree Honours students, the B.Ed., M.Ed. students and research scholars to collect information on the level of intelligence of
the Khasi speaking students of the state. This will be a great help to them to get the correct information. The test can also be used by research workers as external criteria to validate another test.