
Putting Things Together...

CHAPTER -VI

SUMMARY AND FINDINGS

6.0 INTRODUCTION

Everybody wishes to succeed in life. And to attain success, people leave no stone unturned. Over the years one means that has shown people the way to success is education. However, there are three main hurdles that often make people stumble and at times even fall, namely, the IQ scores, marks or percentages secured by individuals in various qualifying examinations, and the instructional strategy. It has been the general practice that based on the scores on these two people are judged, labeled and treated. These two score show whether an individual is intelligent or not. But whether the intelligence of an individual can be measured or not clarity needs to be established as to what intelligence really is. Further, the academic progress of an individual largely depends on the instructional strategy that is being followed in our educational system. Therefore, first, the concept of intelligences has to be clarified. Having done that, its tools of measurements, namely, the examination and the IQ test and finally the way of teaching-learning process, that is, the instructional strategy would be dealt with.

6.1 CONCEPT OF INTELLIGENCE

Philosophers over the years have attempted to answer this twin question, namely what is intelligence and how can this be mea-

sured. Intelligence, Socrates thought, was equal to knowing oneself because all men by their very nature desire to know. To confirm this view, Descartes said; "I think therefore I am". This leads to the belief that intelligence was synonymous with thinking. Intelligence therefore came to be considered as some sort of an inviolable capacity. Taking the cue from biology and having defined life as "the continuous of the internal relations to the external relations", Herbert Spencer believed that adjustment was achieved by virtue of intelligence in man (Guilford, 1967). But this did not satisfy all. More investigations were required.

After intensive investigations on the topic, Spearman (1927) came with the Two Factor theory of intelligence. According to this theory, intelligence of a person is composed of two factors, namely the general (g) and the specific (s) factors. Not satisfied with this, Thurstone (1938) proposed a family of nine primary mental abilities namely, Visual or Spatial, Numerical, Perceptual, Verbal, Memory, Induction, Deduction, Word Fluency and Problem Solving abilities with none preeminent among them. Even this did not survive the test of satisfaction. Then came the famous Structure of Intelligence by Guilford. He posited that human intelligence had a definite structure with four Contents, namely, Figural, Symbolic, Semantic, and Behavioural, five Operations, namely, Evaluation, Convergent thinking, Divergent thinking, Memory, and Cognition and six Products, namely, Units, Classes, Relations, Systems, Transformations and

Implications (Guilford, 1967). This structure of intelligence, when seen in the light of the theory of Multiple Intelligences, does ring a bell of at least some of the Intelligences that Gardner talks about. For example, Guilford talks of Relations and Transformations as Products and Behavioural as Content which could be seen as related to Gardner's Interpersonal, Intrapersonal and Existential Intelligences. Similarly, what Guilford terms as Figural and Symbolic we might see them as Spatial Intelligence.

This satisfied the inquisitive mind about the concept of intelligence theoretically. But we were still very far from really defining intelligence on practical terms. Then emerged in the scene the Binet's faculty theory of intelligence. According to this, intelligence was understood to be one of the faculties of mind. This could be developed to its maturity by resorting to specific exercise and specific training. Unfortunately, though both philosophically as well as theoretically this too turned out to be unacceptable, as the most crucial question of its measurement could not be ascertained. That is why Spearman (1927) called this faculty theory of intelligence of Binet "inconceivably illogical". It was illogical because the theory did not help measure intelligence. Therefore there had to be some other way of defining intelligence.

6.2 DEFINITION OF INTELLIGENCE

Over the years, many eminent psychologists and educationists have

made serious attempts in defining Intelligence. Yet there is hardly any one definition that could be taken as the definition of Intelligence. In fact there seems to be no agreement at all among the psychologists and the educationists as far as a single definition of Intelligence is concerned. Opinions such as, Intelligence is the ability to solve general human problems, is the ability to think in terms of abstract ideas, is the ability to learn, is the general mental adaptability to new situations, problems and conditions, is what the Intelligence tests test etc. are quite common. Dandekar (2002) says that Intelligence is (i) The ability to profit by experience. (ii) The ability to adjust to one's environment. (iii) The ability to solve problems. (iv) The ability to perceive relations. (v) The ability to think in abstract terms; and (vi) The ability to learn.

Dandapani (2000) similarly summarizes various definitions / descriptions of Intelligence in terms of its predominant characteristic as: (i) Adaptation to novel situation. (ii) Abstract thinking. (iii) Purposive behaviour. (iv) Economy and efficiency of performances; and (v) Ability to retain and retrieve past knowledge.

Chatterjee (2000), after having thoroughly studied the meaning and implications of definitions/descriptions furnished by some of the well-known psychologists and educationists, has categorized them under five categories, namely: (i) Biological definitions. (ii) Physiological definitions. (iii) Educational definitions. (iv) Sociological definitions; and (v) Faculty definitions.

Each of these above-mentioned categories requires an explanation. Biological definitions of intelligence refer to those statements/phrases that deal with the person's ability to adjust to various situations, conditions and environments. Those definitions / phrases that attempt to define intelligence as "the function of physiological process" such as that of the nervous system are called Physiological definitions. The Educational definitions are self-explanatory. All statements pertaining to learning would be called Educational definitions of Intelligence. There are still other statements/descriptions about Intelligence that speak of one's behaviour in the group, his/her relationship therein etc. These are called Sociological definitions. And finally, definitions related to abstract thinking are called the Faculty definitions.

However, all these earlier attempts of defining intelligence suffered from a serious weakness as "a definition that satisfies the needs of univocal communication must contain referents in the real world or must point unambiguously to something that points to referents in the real world" (Guilford, 1967, p.12). Boring (1950) for example defined intelligence "as the capacity to do well in an intelligence test". In other words, what he implied here was that intelligence was what the intelligence tests test. That is, the content of the intelligence test is intelligence. Obviously, this way of defining intelligence is unacceptable. How can we know the content of an intelligence test's question? Therefore there was a need of defining intel-

ligence in terms that themselves needed no further explanations, which could be in terms of some observable and behavioural phenomena.

Satisfying these conditions, Wechsler (1958) provides the best working definition of intelligence. According to him, "intelligence is the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment". This is probably the best operational definition of intelligence we have. The three behavioural components of an individual namely, to act purposefully, to think rationally and to deal effectively with his environment are by far much simpler to understand as these are behavioural in nature. Intelligence hereafter will be used in this sense.

6.3 EXAMINATION

An examination, Vernon (1971) opines, is employed as a test of achievement, to prove that an individual pupil has, or has not acquired a certain amount of knowledge of a subject; it is for assessing the efficiency of the teachers whose pupils are examined; it acts as a prognostic agent for predicting students' future achievement; it provides an opportunity for the manifestation of any hidden talent; it could also and in fact it must act as an incentive for stimulating students to work; and it is to facilitate the act of diagnosing students. Interestingly, if we examine the above functions of exami-

nation as propounded by Vernon closely what would strike us almost immediately is that irrefutably the last function stated by him occupies the centre-stage.

Examinations today are conducted largely for its diagnostic function. That is to say that the examinations today are conducted to ascertain how much students do not know! A deficit diagnosis is what is achieved. Students are made to take a two or three hour examination. After a certain period the results are published where marks are awarded to the students. And based on these marks the worth of an individual student is measured.

If marks reflect *only* academic achievement and are assigned consistently according to a system, such marks may be compared with considerable validity (as long as the system according to which the marks are assigned is made clear). But when a single mark represents a hodgepodge of factors (e.g., achievement, attitude, attendance, punctuality, or conduct) or systems (e.g., comparison with other students, comparisons with standards of effort, or improvement), interpretation or comparison of such marks becomes a hopeless task. Unfortunately, the latter case characterizes some marking practices today. (Kubiszyn & Borich, 2003, p 216).

And this undoubtedly is being very unfair to the students. What is even worse is that based on this deficit diagnosis (marks/percent-

age) a student is pigeonholed as intelligent, bright, smart, clever, weak, poor, 'good for nothing' etc. With the help of these marks it is claimed erroneously that the intelligence of students has been successfully measured.

6.4 IQ TEST

Having thus defined intelligence operationally, the next important task at hand is to find ways and means to measure it. Various eminent psychologists have made numerous attempts in this regard. To mention some of the better known tests, we have the Simon Binet Intelligence Test, Wechsler Adult Intelligence Test (WAIS), Raven Progressive Matrices Intelligence Test, etc. Of these and many others, the one that has served the most is the Intelligence Quotient, (I.Q.), test, the final product of Simon Binet's intelligence tests – L and M forms. With the help of the I.Q. test a person's intelligence is being measured even today.

6.4.1 IQ – A SINGLE SCORE

With the help of the IQ test a single score is obtained and based on that score an individual is labeled either as gifted or as moron, imbecile, stupid etc. depending upon where lies the score. What definitely seems to be emphasized in this process is the fact that intelligence of a person is a single entity which it is clearly not. Rather it is a multiple reality (Spearman's Two factor theory, Thurstone Family theory, Guilford' Structure of Intelligence etc.).

Gardner (1983) refutes the concept of intelligence being a single entity. He says, "It becomes necessary to say, once and for all, that there can never be, a single irrefutable and universally accepted list of human intelligences". According to him, human intelligence is characterized by three things, namely;

- i. a set of skills that enable a person to solve genuine problems encountered in life,
- ii. the ability to create an effective product or offer a service that is valued in a culture, and
- iii. the potential for recognizing or creating problems, thereby establishing the necessity for the new knowledge.

Therefore, while measuring the intelligence of a person, it needs to be borne in mind that what is measured is a multiple reality and not a single entity as it is often mistakenly conceived.

6.4.2 INCONSISTENCY OF IQ

There is the whole question of the very consistency as well as constancy of the IQ. Dandapani (2000), for example, asserts that the IQ of an individual determined during his/her infancy continues to be the same, that is, it remains unchanged as long as that individual continues to live in the similar environment. This leads us to believe that the intelligence of an individual is stimulus dependent. And so, as long as the environment/stimulus is similar the IQ of the individual is more or less constant. But with the change in the environment the IQ would also change. Chatterjee (2000) reinforces this stand:

- i. The IQ does not remain constant. The change in the environment may bring out a change in the IQ.
- ii. The IQ is the product of native endowment and training.
- iii. No test is completely reliable. Repetition of the same test on the same subjects may not give the same IQ.
- iv. Fluctuation occurring in the IQ stems from fatigue, lack of motivation and other personal factors of the tests and the personal equation of the examiner.
- v. IQ fluctuates in case of infants. But it relatively remains constant between ages 4 and 15.

Thus, one thing that becomes abundantly clear from the above discussion is that the IQ of a person cannot be determined once and for all. It needs to be accepted that although the IQ score of a person at any given moment of time is a valuable tool towards predicting the intellectual success of an individual, the person cannot be labeled for his / her whole life. The score is not a life time determinant. Let us then pry into the effects of the IQ score a little more.

6.4.3 NEGATIVE EFFECTS OF AN IQ SCORE

Even while acknowledging the contribution of the IQ test in the field of education it is highly imperative for us not to close our eyes to the other side of the coin. Undoubtedly, the IQ test score does point to the individual's abilities. It is a label that is supposed **to predict** whether a person will be able to do certain work. In reality, it does predict to a large extent what **could be** the future of that

individual. But what it does not say with definite finality is what **will be** the future of that individual. This latter aspect of the IQ score is sadly overlooked. Most often, it does become the final word. That is why Sternberg (2000) laments, "The predictor becomes more important than the achievement itself, and instead of acknowledging that there is something wrong with the test, we conclude that there must be something wrong with the person". According to him, the most unfortunate of all 'contributions' of the IQ test is the act of labeling of individuals based on their IQ test scores. Individuals are, as it were, marked/labeled almost once for and all. As a consequence of this labeling a number of other unfortunate and undesirable phenomena occur. So much so that these begin to appear very normal and even natural at times.

The IQ test score becomes a handy tool for labeling a person. Labeling of individuals in turn leads to expectations from them according to their labels. There are two kinds of expectations, both positive as well as negative. For the average and above in the spectrum of IQ rating scale, the expectations are positive as they continuously challenge the individuals to live up to their labeled standards. They are challenged all the time to perform better. This is good. However, those below average in the IQ rating scale, the expectations are negative as they hardly challenge the individuals. Everyone expects a moron, for example, to perform befitting a moron. He/ she is never expected to perform as a genius. And so when he/

she scores poorly in the evaluations, he /she is not blamed because that is what is expected of him/her. Neither the teachers nor the parents are disappointed. Yes, no one is disappointed as everything happened according to the expectations. This leads to another malady in the IQ world, the self fulfilling prophecy.

The expectations give birth to the philosophy of Self Fulfilling Prophecy among the individuals. Individuals begin to believe that if one is labeled as a moron, then he/she is a moron. Similarly if one is labeled as average, then he/she is just that. The same thing begins to happen to one who is labeled as a genius. Whatever be the labeling, individuals begin unconsciously to believe in their labeling. Consequently, they work exactly in accordance with their labeling and the expectations thereof. The genius work harder still to meet the expectations of their authority figures believing that they are capable. Very well! But those below average work only so much that would meet the expectations of the authority-figures believing that is what they are capable of. They begin to believe that they have nothing higher to aspire for. Ultimately thus the labeling become the self fulfilling prophecy of individuals.

The expectations affect those labeled below average the most. They tend to work only as much as deemed sufficient to fulfill the expectations. And they seem to be perfectly comfortable and satisfied with that. The authorities too begin to provide them with opportunities to these individuals only so much that would be sufficient to

meet their expectations. As a result, opportunities that could help these individuals to improve their performances dry up. They are not exposed to more challenging situations that could inspire the average and below to raise their standards. And indeed how could they raise their standards if they are not provided with the opportunities.

Finally, labeling leads to complacency among the individuals who are labeled average and below average. As they haven't to aspire for greater, higher, they are satisfied with the little. Hard work among them seems to be a thing alien. And why should they even think of working hard when everyone is satisfied with what they are performing? Their performance is perfectly in congruent with their labeling and expectations subsequently. On their part, since they have come to believe in their labeling they are comfortable with the little. Thus, their complacency kills the little genius inside them that may be fighting hard to show forth itself! In short, the IQ score, instead of doing good to the average and below average individuals, ultimately proves to be their enemy that kills their creative potentials.

Thus, the test that is intended to measure the intelligence of individuals may turn out to be contagious disease gradually killing the little genius! But the test itself can hardly be blamed for it. For, "If IQ rules, it is only because we let it. And when we let it rule, we choose a bad master. We got ourselves into the test mess; we can get ourselves out of it" (Sternberg, 2000).

6.5 SILVER LINING

In spite of its potential disastrous consequence, the success, utility and importance of the I.Q. test had not been questioned till the arrival of Howard Gardner and Daniel Goleman. With their arrival the silver lining had appeared. They were among the first ones to openly challenge the ultimate validity of the I.Q. test when they propounded the theories of Multiple Intelligences and the Emotional Intelligence respectively. Without going into the details of their differences, in a very simplistic way, these two contended that an individual's intelligence was far from being a single entity. Rather it is a multiple reality. They had arrived at this conclusion after years of serious research among the professionals. Today, in addition to these two there are also a third and a fourth contender among them, namely the Spiritual Intelligence and the Successful Intelligence. For the present study, however, the investigator was exclusively concerned with the Multiple Intelligences only.

6.6 MULTIPLE INTELLIGENCES

In his career long research Howard Gardner realized that the I.Q. index although did provide an indication of one's general intellectual ability, it definitely was not the all of an individual's intelligence. How could such a complex reality as intelligence have been possibly measured with a single score? He further posited that the intelligence of an individual is a multiple reality. And so he at first proposed seven intelligences, namely, the Linguistic Intelligence, Logical Mathematical Intelligence, Spatial Intelligence, Bodily - Ki-

esthetic Intelligence, Musical Intelligence, Interpersonal Intelligence, and Intrapersonal Intelligence. To these seven he added an eighth one, the Natural Intelligence and after his further exploration into the subject he has now added the ninth one also, namely the Existential Intelligence.

However, even as when he made this claim, at the starting point of his contentious journey, he honestly confessed, "the exact nature and breadth of each intellectual 'frame' has not so far been satisfactorily established, nor has the precise number of intelligences been fixed. But the conviction that there exist at least some intelligences, that these are relatively independent of one another and that they can be fashioned and combined in a multiplicity of adaptive ways by individuals and cultures, seem to me to be increasingly difficult to deny" (Gardner, 1983, pp. 8-9). This was his initial confession. Today, however, he asserts with a fair amount of confidence that human intelligence is definitely not a single entity. There are many intelligences. He has already propounded nine and in future there could be some more added to the list provided they pass the eight tests, which form the basis of Multiple Intelligences discussed in the next section. Let us now very briefly familiarize ourselves with these nine intelligences.

6.6.1 LINGUISTIC INTELLIGENCE

Linguistic intelligence is the ability to use with clarity the core operations of language. It is the ability to use language to describe

events, to build trust and rapport, to develop logical arguments and use rhetoric, or to be expressive and metaphoric. People with linguistic intelligence have sensitivity to the meaning of words – the capacity to follow rules of grammar, and, on carefully selected occasions, to violate them. At a somewhat more sensory level - sensitivity to sounds, rhythms, inflections, and meters of words – that ability which can make even poetry in a foreign tongue beautiful to hear. And a sensitivity to the different functions of language- its potential to excite, convince, stimulate, convey information, or simply to please. The ability to mesmerize one's audience whether with just a small speech or to keep them spell bound for hours together with practically no substance at all is possessed by the Linguistically intelligent persons. These can create new meanings with the same old words or phrases of a language. A language remains alive largely due to these people. This intelligence is manifested best among the storytellers, administrators, salespersons, clergy, counselors, lawyers, philosophers, playwrights, orators, politicians, editors, journalists etc.

6.6.2 LOGICAL MATHEMATICAL INTELLIGENCE

The Logical mathematical intelligence, primarily, is the capacity to use and manipulate numbers effectively and to excel in reasoning. It is the capacity to recognize the inherent logical patterns in things, events, etc. It is the ability to use numbers to compute and describe, to use mathematical concepts to make conjectures, to apply mathematics in personal daily life, to apply mathematics to data

and construct arguments, to be sensitive to patterns, symmetry, logic, and aesthetics of mathematics, and to solve problems in design and modelling. It is the ability to discover the cause-effect relationships in the world. In other words, this intelligence ensures that reasoning must precede everything. Things must be logical and coherent. Thus, mathematicians, accountants, lawyers, scientist, computer programmers etc. exhibit this intelligence.

6.6.3 SPATIAL INTELLIGENCE

The Spatial Intelligence is characterized by the ability to perceive the visual-spatial world accurately and to perform transformations on those perceptions. Further, special sensitivity to colours, forms, space, shapes and their relationships distinguishes this intelligence. The capacities to visualize vividly with ease the verbal concepts and information tell us of the development of this intelligence. In other words, it is the ability to perceive and represent the visual spatial world accurately, to arrange colours, lines, shapes, forms and space to meet the needs of others, to interpret and graphically represent visual or spatial ideas, to transform visual or spatial ideas into imaginative and expressive creations. The Fine Artists, people working in the field of advertising, interior and exterior decorators, sailors, engineers, surgeons, architects, painters, carpenters, masons, jugglers, theatre artists, sculptors etc. can be seen as possessing and to have developed this intelligence.

6.6.4 BODILY-KINESTHETIC INTELLIGENCE

To be intelligent Bodily-kinesthetically means to deal with and to manipulate body movements effectively and meaningfully to express ideas and feelings. The ability to handle object skillfully is another characteristic of this intelligence. To perform specific bodily movements with proper balance and coordination of various parts of the body requires this intelligence. The performing artists, sports persons, even surgeons, craftsmen, instrumentalists, artisans etc. exhibit this intelligence.

6.6.5 MUSICAL INTELLIGENCE

The Musical Intelligence, as the name itself indicates, is the ability to handle, perceive, discriminate, transform, compose, and express musical tones. It is the ability to understand and develop musical techniques, to respond emotionally to music and to work together to use music to meet the needs of others, to interpret musical forms and ideas, and to create imaginative and expressive performances and compositions. Sensitivity to rhythm, pitch, etc. of music is the hallmark indication of this intelligence. A musically intelligent person is able to create melodious compositions out of individual musical notes. He /she is able to perceive the fine distinctions between notes. Further, he/she is able to relate mere prosaic presentations with more poetic ones. Facts and ideas he/she can put in musically which often becomes more pleasant not only for the purpose of their presentations to others but which also turn out to be easier for remembering.

6.6.6 INTERPERSONAL INTELLIGENCE

The Interpersonal Intelligence is the ability to perceive and make distinctions in the moods, intentions and feelings. This is to be sensitive to and recognize various bodily expressions such as facial, gestures, voice/tone etc. of another, to have the distinction of being attractive and magnetic and to be able to share/exchange these with another and even influence others effectively. It is the ability to organize people and to communicate clearly what needs to be done, to use empathy to help others and to solve problems, to discriminate and interpret among different kinds of interpersonal clues, and to influence and inspire others to work towards a common goal. This intelligent is best manifested among the administrators, managers, politicians, social workers, doctors, nurses, therapists, teachers, sociologists, psychologists, consultants, evangelists etc.

6.6.7 INTRAPERSONAL INTELLIGENCE

Apart from being able to relate with others meaningfully, there is a greater need to know oneself. Self-knowledge, that is, to have an accurate knowledge of oneself is essential for a sustained interpersonal relationship. Intrapersonal Intelligence facilitates this process. It is the ability to assess one's own strengths, weaknesses, talents, and interests and use them to set goals, to understand oneself to be of service to others, to form and develop concepts and theories based on an examination of oneself, and to reflect on one's inner moods, intuitions, and temperament and use them to create or express a personal view. To be aware of one's own moods, feel-

ings, inner desires and aspirations, motivations etc. not only enhance self-esteem but also at the same time enrich societal living. Intrapersonal intelligence is best manifested among planners, businessmen, psychologists, artist, religious leaders. As stated above, a strong Intrapersonal intelligence is almost a prerequisite for strong interpersonal relationship. This is the binding force as it were of any relationship.

6.6.8 NATURALISTIC INTELLIGENCE

The Naturalistic Intelligence is exhibited in one's expertise in understanding, recognizing, relating to, distinguishing and classifying the flora and fauna of one's environment. Further, to show special love and sensitivity to nature and the natural phenomena one needs Naturalistic Intelligence. Biologists, Environmentalist, Geologists, farmers, hunters etc. require this intelligence.

6.6.9 EXISTENTIAL INTELLIGENCE

This intelligence is the newcomer among the above-mentioned eight intelligences. It is the ability to recognize, uphold, share, and impart values (social, religious, human) of life. This is concerned with human's living and not merely existing. Advocates of value education, for example, need their existential intelligence developed more!

6.7 BASIS OF MULTIPLE INTELLIGENCES

The theory of Multiple Intelligence has not yet been fully appreciated and their potential exploited in the educational process. Simple

questions like, what is new about this? How are they different from talents or skills or competencies or aptitudes? What is the basis for this? etc. have already been asked by the people. That is to say that the theory has not been accepted as having universal application. Yet Gardner hasn't been discouraged. He is fully aware of the objections raised regarding the authenticity and universal applicability of Multiple Intelligences. Despite these he consciously prefers to call these 'intelligences' and not simply be satisfied by calling them talents or aptitudes. "I am deliberately being somewhat provocative. If I'd said that there are seven kinds of competencies, people would yawn and say 'Yeah, Yeah'. But calling them 'intelligences', I am saying that we have tended to put on a pedestal one variety called intelligence, and there's actually a plurality of them, and some are things we have never thought about as being 'intelligence' at all " (Weinreich-Haste, 1985, p. 48). He then calls these intelligences because these pass the eight tests / evidences, namely:

1. Potential isolation by brain damage.
2. The existence of Savants, Prodigies, and other Exceptional Individuals.
3. A distinctive development history and a definable set of expert "End State" performances.
4. An evolutionary history and evolutionary plausibility.
5. Support form psychometric findings.
6. Support form experimental psychological tasks.
7. An identifiable core operation or set of operations, and
8. Susceptibility of encoding in a symbol system.

6.8 DEVELOPMENT OF MULTIPLE INTELLIGENCES

As stated above, these intelligences can be developed to an adequate level of competency. Given an opportunity each of these nine intelligences can be developed by all. Therefore, at any given moment of time Gardner would hesitate to say that this one or that one is either the weak or strong intelligence in someone. Who knows that the one considered as weak intelligence of someone, some day in a more appropriate condition that might not turn out to be his/her strongest! This appropriate condition according to him can be the following three factors:

1. Biological endowment including hereditary or genetic factors and the accidental factors like brain injuries before, during and after birth. For example, a lame or a fat boy cannot possibly be a good athlete or a dancer. (Exceptions in rare cases not ruled out!)
2. Personal life history of an individual too plays a significant role in the development of his/her intelligences. Parents, teachers, guides coaches, peers, friends -all can help an individual develop his/her intelligences significantly. The opposite too can be the case.
3. Cultural and historical background of an individual too can either accelerate or retard the development of intelligences. The economics too is not ruled out.

The development of any of the intelligences would depend mainly on two factors, namely, the Crystallizing or Paralyzing experiences.

These experiences often take place very early in one's life and act like turning points for the individual. While the crystallizing experiences enhance the development of intelligences the Paralyzing experiences retard the development of them. In fact, the crystallizing experiences of an individual almost set a platform, as it were, for the development of that/those intelligences. Quite, on the contrary, the Paralyzing experiences almost draw the curtain for an individual. After a Paralyzing experience an individual almost certainly comes to a full stop as far as the development is concerned.

Further, it also depends on certain situational factors, such as, access to resource person/persons or mentors, the historical/cultural atmosphere, geographical, and familial factors. A coach for, example, may spot certain talents of an individual in a particular field or area of the game of which the player him/herself was never aware. Upon coach's guidance the individual may start working on it. And who knows one day that individual may even excel beyond anybody's imagination! Similarly, in an era or a race or a nation where the study of music or art is culturally valued, it is likely that the children of that era or race or nation would develop their musical or spatial intelligences more than the other intelligences. Much in the same way the normal, familial atmosphere play a great role in the growth and development of intelligences of individuals.

Further Gardner (1993) adds that as far as the distribution of the intelligences among the two sexes is concerned, these are distrib-

uted evenly. There is no evidence at all to assert that these are distributed among the two sexes in any preferential manner. Neither the males nor do the females enjoy any kind of advantages.

6.9 PRINCIPLES OF MULTIPLE INTELLIGENCE THEORY

From the above discussion on the theory of Multiple Intelligences it is possible to condense the whole theory itself into some basic principles. These principles could provide a bird's eye view to the entire theory; one does not have to conduct a study of the theory of Multiple Intelligences to know what it is. For the purpose of familiarizing oneself with the theory, these principles would suffice.

1. Human intelligence is not a singular entity; it is a multiple reality.
2. Every person is a unique blend of dynamic intelligences.
3. Intelligences vary in their development, both within and among individuals.
4. All intelligences are dynamic.
5. Multiple Intelligences can be identified and described.
6. Every person deserves opportunities to recognize and develop the multiplicity of intelligences.
7. The use of one of the intelligences can be used to enhance another intelligence.
8. Personal background, destiny and dispersion are critical to knowledge, belief, and skills in all intelligences.

9. All intelligences provide alternate resources and potential capacities to become more human, regardless of age or circumstances.
10. A pure single intelligence is rarely seen.
11. Developmental theory applies to the theory of Multiple Intelligences.
12. Any list of intelligences is subject to change as we learn more about Multiple Intelligences.

Having thus familiarized ourselves with the theory of Multiple Intelligences, it is time now to come to the present study.

6.10 THE PRESENT STUDY

The present study was an attempt to investigate the effects and implications of an instructional strategy which incorporated in it the theory of Multiple Intelligences.

6.11 RATIONALE OF THE STUDY

More than ever before the human life has become increasingly complex. With the scientific developments new problems, new opportunities have arisen. In fact, without any fear of exaggeration, it may be stated that humankind today is in the era of specialization. Whether in the field of science and technology or in that of human relationships or even in that of our material needs, there is an urgent need of people with specialization. This is possible only if individuals' specific talents and intelligences are spotted in time

and are provided thereafter with appropriate training. We can do this only if we know the persons with such orientations in right time. This ought to be function of education today.

According to M K Gandhi, the father of our nation, the aim of education is the all round development of man. It attempts to draw the best out of man/woman. If that is the aim of education, then we need to understand as much as possible, the human person as a whole. To achieve this aim of education, of course, the system of education does incorporate in itself the findings of various disciplines of learning.

The present instructional system comprises of mainly two major parts, namely the act of instruction and that of evaluation. And both of these must go hand in hand. The act of instruction, first, be such that it is in accordance with the reality of individual difference. Further, it must also be such that the individuals undergoing the instructions are evaluated appropriately for their learning outcomes. Now let us look at the prevailing practice of instruction.

The predominant method of teaching/instruction today is the lecture method. This practice undermines the reality of individual difference among the students.

Individual differences among the students are of different kinds. Apart from their physical and social differences, they are different

in their learning style preferences; they are different in their intelligence levels. Today we know that students learn differently. When these are known to educators, it is hardly a justifiable practice that the lecture method should dominate the instructional field. Students today need to be provided with opportunities for the optimum development of their interests, aptitudes, basic orientations - in all, their potentialities. Further, they need to be guided appropriately so that they are able to bloom wherever they are planted. But to guide a student meaningfully and appropriately, one must know the students. It is here the prevalent system of education clearly falls short.

The lecture method is inadequate because it does not cater to the needs of students showing their own preferential styles of learning. It fails to address to the needs of the students much less to challenge students for higher and better performance.

The other aspect of any instructional strategy is the act of evaluation. The present system of education being excessively preoccupied with the examinations doesn't really cater to the individual's needs as per their capabilities. Too much importance is vested on the standardized evaluation of students even when the psychological findings make it abundantly clear that there exist no standard students. At the end of the teaching learning process, students are examined with stereotyped 'standard' examinations. This kind of standard examination often tends to examine how much the stu-

dents don't know! Chengappa (2005) summarizes the views of experts in education on the present examinations very succinctly as, "the focus is on memory instead of understanding and thinking capability", "one size fits all doesn't have to be the case. There is strength in diversity", "Exams are made out to be monsters rather than stepping stones", "Class XII is seen as the end of the world. The Last Chance Saloon". Clearly, the experts do not uphold the present examination system because not much is achieved by this process. Hardly can it be said that the individuals are truly evaluated. Students are awarded marks/percentages. Based on these marks/ percentages they are labelled almost once for all leaving almost no room for the further development of their personalities as well as their success in life. These marks / percentages open the door to personal disasters - unemployment, rise in emotional stress, (living a pressure cooker lives) leading to suicides (Saxena, 2005). 'Fear of failure' grips the minds of students. There is hardly anything that the students can hold on to. They begin to equate their worth with the percentage of marks. Students fail to realize that they worth much more than the percentage of marks that they are awarded. Consequently, securing low percentage seems to be the end of the road. It is as though they have hit a blind alley. This kind of 'marks' orientation clouds their vision so much that marks become synonymous to success and personal human worth. What they forget is that there is still a wide world open before them. But they cannot be blamed for this as they have not been exposed to all of intelligences in a serious manner. Their achieving low percent-

age hardly takes into account all the other ways they can be intelligent and score 'high percentages'. If only the theory of Multiple Intelligences found its place in the school instructional strategy, the number of pre and post result declaration suicides would, the researcher feels, definitely decrease.

The theory of multiple intelligences offers us exactly that almost in a platter, as it considers the totality of a person. It shows us that one can excel, if not in one field then at least in the other. For example, those who cannot solve a mathematical problem can perhaps, who knows, mesmerize the world with their melodious voice. Those who cannot memorize the 'twinkle twinkle little star' may perhaps turn Michelangelo jealous of them! What really counts is that they be offered with the possibilities, a chance. Should it happen, then, the educational system unlike today will churn out employable youth.

Thus, for both, the appropriate education of the individuals as well as for their true evaluations, we need to go beyond today's instructional strategies employed in our educational system. It is time that the students are instructed and evaluated wholesomely. There is a need of a paradigm shift in the process of instruction to as well as evaluation of students. The theory of Multiple Intelligences offers us precisely that. As is evident from the exposition earlier, the theory of Multiple Intelligences definitely opens before us a door of

enormous possibilities in the field of education. At the same time, it compels us see the process of education itself in a radically and tremendously challenging way. And because it shakes the very understanding of the human person, it becomes inherently challenging. The theory itself, though not in the present terminology, propounded way back in 1983 has neither been received enthusiastically nor has it been incorporated in the Indian educational system. Except for some Action Researches and works by the very advocates of the theory, no one has carried out any research as far as its implementations are concerned. After having realized the potentialities thrown before us, the researcher feels therefore challenged to explore the possibilities of the implementation of the theory in the actual teaching learning process, hence the present research.

6.12 TITLE OF THE STUDY

The present study was titled: "A Study of the Development and Implementation of an Instructional Strategy incorporating the theory of Multiple Intelligences".

6.13 CLARIFICATION OF THE TERMS

The phrase "instructional strategy incorporating the theory of Multiple Intelligence" is shortened as the MI Instructional Strategy. Hereafter, in the rest of the discussion it will be used as such.

6.13.1 DEVELOPMENT

The phrase 'development of the instructional strategy' means the

researcher familiarizes the sample teachers with the theory of Multiple Intelligences. Having got them familiarized with the theory, he then helped them remodel the lesson plans incorporating the theory of Multiple Intelligences. The process of remodelling lesson plans which also contained the tools for evaluation is the development of the instructional strategy.

6.13.2 MI INSTRUCTIONAL STRATEGY

The term instructional strategy is used here to mean both the teaching as well as the evaluation processes. In the MI instructional strategy, instead of the usual lecture method of teaching, students are instructed with the help of the remodeled lesson plans incorporating the theory of Multiple Intelligences. These remodeled lesson-plans incorporate elements that would meet the needs of students' various learning preferences / styles so that students learn with ease. Activities like acting, hands-on exercises, group discussion, a minute of quiet reflection, singing, number games, drawing and sketching etc. are incorporated in the teaching process. These activities are intended to meet the needs of individuals who show a wide range of preferences in their learning styles. For the purpose of evaluating the performances of the students again, instead of the usual teacher made tests which generally are based on linguistic, logical mathematical and to a certain extent spatial intelligences, the modified teacher made tests would also include test elements from the domains of other intelligences like musical, bodily-kines-thetic etc.

6.13.3 MULTIPLE INTELLIGENCES

Multiple Intelligences are not to be confused as being synonymous with abilities, special interests, or talents, or aptitudes. These are ways of understanding human intelligence in the context of various preferential styles of learning and knowing exhibited by individuals. Although these may be used in the classroom, these are not to be understood as a set of prescribed methods of teaching. Neither are these to be understood as some clearly defined curriculum or a bundle of techniques. On the contrary, in the classroom this may help teachers develop classroom activities that would address students' multiple ways of learning and knowing. As of now, these are the nine intelligences of a human person as recognized and being popularized by Gardner. They are the Linguistic, Logical Mathematical, Spatial, Bodily-Kinesthetic, Musical, Interpersonal, Intrapersonal, Naturalistic and Existential Intelligences. In the future, there could be others too.

6.14 DELIMITATION OF THE STUDY

The present study was delimited to the teachers of one school and the students of Standard VIII of the same school following the Indian Certificate of Secondary Education, (ICSE) syllabus situated in Namchi, the South district of Sikkim.

6.15 OBJECTIVES OF THE STUDY

The present study was carried out with the following research objectives:

1. To map the Multiple Intelligences Profiles, (MIP), of teachers as well as that of the students.
2. To enable teachers carry out instructions using the MI instructional strategy.
3. To assess the achievement of the students following instructions in the Multiple Intelligence way.
4. To assess the Teachers' instructional behaviour as the result of the training in the theory of Multiple Intelligences.

6.16 RESEARCH QUESTIONS

The research was conducted with the following research questions in mind:

1. Could the MIPs of teachers and students affect the teaching and learning processes?
2. How could the theory of Multiple Intelligences be implemented in the Instructional strategies?
3. Will there be any significant contribution of the theory of Multiple Intelligences in the teaching learning process?
4. Would there be any change in the perception and motivation of the teachers due to the implementation of the Multiple Intelligences theory in the teaching learning process?

6.17 DESIGN OF THE STUDY

It is an experimental study insofar as the assessment of the effect of the instructional strategy developed by the researcher and the com-

parison of the achievement tests before and after the intervention programme are concerned. However, as there was neither the Control Group nor any hypothesis to be tested in the study, it does not follow a true experimental design. Even though there is the comparison of the pre and post intervention programme achievement tests, and hence it might appear as a Pretest - Posttest Single Group design, it is not strictly an experimental study. It is a quasi experimental study following a quasi experimental design.

6.18 TOOLS

The following tools were employed for this study:

1. Cumulative Record Cards of students.
2. Teacher-made Achievement tests.
3. Observation, Unstructured interviews, Anecdotal records, and Motivation scale.
4. Two Multiple Intelligence Inventories:
 - i. Multiple Intelligence Inventory for Adults by Armstrong.
 - ii. Multiple Intelligence Inventory by McKenzie.

6.19 PROCEDURE

6.19.1 SAMPLING

All students of Standard VIII and, although all the teachers of the school were given the orientation programme on the theory of Multiple Intelligences, only the teachers teaching in Standard VIII constituted the sample of the study. The school, situated in the south

district of Sikkim, as well as the sample were chosen purposively according to the geographical feasibility and the consent of the head of the institution. Standard VIII was being considered for this study because it was presumed by the researcher that the students of Standard VIII would have attained the level of intellectual maturity suitable to understand and appreciate the theory of MI and its implications in the field of education.

6.19.2 DEVELOPMENT AND IMPLEMENTATION OF THE INTERVENTION PROGRAMME

- i. The researcher developed the training materials for orienting the teachers in the theory of MI.
- ii. Having developed the training materials, the researcher then organized two workshops each of one week duration to familiarize the teachers with and initiate them in the theory of MI and its promises in the field of education. During these workshops the teachers were assisted in remodelling the lesson plans according to the theory of MI. Subjects chosen for remodelling the lesson plan were Mathematics, Science, and Language.
- iii. The Multiple Intelligence Profiles, (MIPs), of students and teachers were mapped with the help of MIP inventories.
- iv. Teachers were assisted in implementing the transactions of the remodelled lesson plans in the actual classrooms. These remodelled lesson plans had a variety of activities, like act-

ing/role modelling, singing, group discussions, drawing and sketching, individual quiet reflections for two minutes, hands on exercises, etc. embedded in them. The researcher observed these classes and recorded the information.

- v. The researcher assessed the motivation of both students and teachers.
- vi. Achievements of the students were assessed with the help of the teacher made tests.

6.20 DATA COLLECTION AND THEIR ANALYSES

Qualitative analysis of the qualitative data collected with the help of Cumulative Record Cards, (CRCs), and the unstructured interviews of the students prior to the intervention programme provided the background information about the students. During the first workshop the MIPs of students as well as that of teachers were mapped and analyzed. The analysis showed the natural and preferential intelligences of students and teachers. During the entire course of the intervention programme with the help of Observation Schedules, Unstructured interviews, Anecdotal Records, Case studies and the Motivation Scale qualitative data were collected and analyzed qualitatively. The analysis provided information about the self perceptions of students and teachers, their motivations as per their respective roles, students' attitudes towards their peers, teachers' attitudes as perceived by the students towards them, and the learning styles of students. Finally, the quantitative analysis of the data collected from the teacher made achievement tests revealed the con-

tributions of the instructional strategy which incorporated in it the theory of MI.

6.21 FINDINGS

The analyses of the data revealed that the instructional strategy incorporating the theory of Multiple Intelligences had a multiplying effect. It affected directly the students and the teachers. Further, it affected the parents and the society in general indirectly as well. Effects of the instructional strategy incorporating the salient features of the theory of Multiple Intelligences in this study may be enumerated as follows:

5.21.1 ON STUDENTS

1. The motivation levels of the students increased. After the intervention programme the students became better motivated towards their studies. They looked more focussed in their studies. They applied themselves diligently in completing the assigned tasks such home works and projects.
2. The self perception and self confidence of the students improved. With the help of their MIPs students realized their natural proclivities, their natural strengths and weaknesses. Consequently they had clearer self perceptions and grew in self confidence.

3. Again, with the help of their MIPs, students grew in awareness of their personal preferential styles of learning. They became aware of how they learnt best and with ease naturally.
4. Introduction to the theory of Multiple Intelligences and its incorporation in the instructional strategy helped students appreciate the merits of Cooperative Learning. Students became aware of the reality that each one of them was intelligent differently. Further, students realized that in areas where one was not so strong/intelligent, some others were. Therefore, they could seek help from each other; they could complement each other in their learning. Hence occasions of Cooperative Learning increased.
5. The academic achievements of the students improved.

5.21.2 ON TEACHERS

1. With the help of their MIPs, teachers became aware of their natural preferences. They knew their natural proclivities. Thus being aware of their own natural preferences, they were able to adapt and employ teaching aids suitable to the students without imposing their own preferences on them.

2. Knowledge of the fact that students had different styles of learning, they were able to modify their styles of instructions so as to meet individual needs. They tried their best to employ teaching aids and instructional methodologies that resonated with the learning styles of the students as much as possible.
3. Knowledge of the MIPs of the students helped teachers to understand them better. While they challenged the gifted students for still more, they treated the slow learners more understandingly and compassionately. Their overall attitudes towards and relationships with their students improved.
4. Realization that each one of them was intelligent differently, and hence 'incomplete', they grew more cooperative among each other. They shared their expertise and also lent their helping hands to each other in conducting various co-curricular activities in the school.
5. The self perceptions of the teachers were modified. They became more committed to the students as well as to the school.
6. Being aware of the different learning styles and the MIPs of the students teachers adopted methods (MI techniques)

of evaluations of the students which were more comprehensive.

5.21.3 ON THE PARENTS

1. Parents showed greater concerns for the education of their children. They assisted them in their studies at home, particularly in their project works.
2. Parents provided atmospheres at home which were more conducive for study.
3. Parents guided their children and motivated them for life according to the particular natural proclivities of their children.

5.21.4 ON THE SOCIETY

1. The social atmosphere too appreciably changed. Just as parents were indirectly affected, so too was the business community. Apart from stocking items which they never had earlier, some of them acted and sold items with responsibility. Students were denied items such as cigarettes, alcohol and tickets for selected video shows during the school hours.

6.22 IMPLICATIONS

The study shows that with the incorporation of the theory of MI in the instructional strategies the entire teaching-learning atmosphere

in the school improved. Taking this study as a pilot study, (which was limited to one class only), and which proved was beneficial both to students and teachers alike, the theory of MI could be incorporated in a much larger scale in an educational institution. In fact, the MI theory may even be adopted by the entire educational system of the nation.

6.23 SUGGESTIONS FOR FURTHER RESEARCH

Every research fulfills at least two functions, first, it acknowledges its limitations, second, and thereby paves the way for the possibilities of further and more detailed research in the field from different perspectives.

Therefore, spurred on by the results of the present study, to list a few, it is suggested that,

1. the implications of the theory of MI in the field of education may be studied on a larger scale involving the entire school.
2. the effect of the theory of MI on the construction of school curriculum could be studied.
3. the organization of the school curriculum could be studied in the light of the theory of MI.
4. the effect the theory of MI on the self perception and motivation of parents and administrators could be studied.
5. the development of more appropriate instructional methodologies could be studied.

6.24 CONCLUSION

The study of the development and implementation of an instructional strategy incorporating the theory of multiple intelligences revealed that, although not altogether a new concept, the theory of MI definitely has the potential to transform the entire educational system. As the entire instructional process would be according to the preferential styles of learning of the students, the process of learning will be a joyful act. Consequently, dropout rates would come down, dreams of universal retention would be realized so that an educational system of the nation would have less to worry about the wastage and stagnation. Further, if understood and applied rightly, it can bring about a total transformation in human relationship and thereby in the human living itself. It would lead to a better understanding of individuals' strengths and weaknesses. Better understanding of individuals' strengths and weaknesses would in turn lead to better employability of individuals. And when individuals are placed where they actually belong to, are best fitted, there will not only be job satisfaction among the individuals but it will also lead to greater productivity. With greater productivity of individuals society in general would be more productive. That would lead to the economic development of the individuals which in turn would usher in the greater economic development and prosperity of the nation. Such is the potential of the theory of Multiple intelligences.

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