

HOLISTIC EDUCATION: AN EXPLORATION OF ITS PHILOSOPHICAL FOUNDATIONS AND SCIENTIFIC UNDERPINNINGS

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ABSTRACT

*The concept and term 'Holistic Education' came into existence into mid 1980s in North America and has become a buzz word in the 21st century. Holistic Education is the need of the hour. Eminent educationists, thinkers and philosophers from ancient Greece (in West) to ancient Vedic Era (in east) have been providing methods, thoughts and reasons for its immediate implementation. Holistic Education is supposed to have its roots in the romantic theories of education proposed by Plato, Rousseau, Pestalozzi, Montessori, Froebel, Dewey etc. in the eastern world. In India it was found in the teaching practices of **Vedic Educational System**. Further its traces can be seen in the teaching of **Srimad Bagavad Geeta**. The concepts of **Panch Kosh** and **Ashtang Yoga** are very much similar to the general philosophy of Holistic Education. Later, **Sri Aurobindo** has implemented this in his concept of Integral education.*

Holistic Education also holds scientific underpinnings. The Brain based learning and system theory work upon the same principles. Neuroscience has proved that brain function is largely implemented in a network and brain regions are closely interconnected. Cognitive, emotional, moral or social functions use more than one brain regions. Therefore our education should also be holistic to produce individuals who would be academically enriched, emotionally balanced, socially acceptable, morally uplifted and spiritually enlightened. The present paper explores the various sources and supporting thoughts of Holistic Education.

Key words : Panchkosha, Srimad Bhagwad Geeta, System Approach, Brain Based Learning, Neuroscience.

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1. INTRODUCTION

*Where the mind is without fear
and the head is held high,
Where knowledge is free;
Where the world has not been broken
up into fragments by narrow domestic walls;
Where words come out from the depth of truth;*

*Where tireless striving stretches its arms
towards perfection;
Where the clear stream of reason has not lost
its way into the
dreary desert sand of dead habit;
Where the mind is led forward by thee into
ever-widening*

*thought and action—
into that heaven of freedom,
my Father,
Let my country awake.*

This poem by Rabindranath Tagore (1861-1941) probably expresses his longing for the nation of his dreams. Perhaps this poem also voices the aim for a truly international and Holistic Education which could be the only medium to create the country of Tagore’s dreams.

The concept and term Holistic Education came into existence into mid 1980s in North America when the Movement for Holistic Education grew. It has become a buzz word in the 21st century because of the drastic degradation in human, social and moral values, and with the emerging problems like global warming, pollution and terrorism. Perhaps the most important cause behind all these is man’s self centric nature and drift towards materialism.

Ron Miller (1992), one of the leaders of Holistic Education movement, says that Holistic Education is not a particular method or

technique of teaching rather it is a paradigm, a set of basic assumptions and principles which can be applied in diverse ways.

Holistic Education is an endeavour to change the foundation of education right from the beginning which is the need of the twenty first century. Therefore Holistic Education is education for twenty first century to develop human beings with a global conscience, a vision of peace, love, and intelligence (Nava 2001).

2. FOUNDATION STONES OF HOLISTIC EDUCATION

The term ‘Holistic’ has been originated from Greek word ‘holism’. It means that the universe is made up of integrated whole (Lee 1997). Without using the term ‘Holistic Education’ various ancient philosophers, thinkers and schools of thoughts have advocated it. Traces can be found from eastern to western horizons.

Holistic Education does not only rely on philosophical grounds, it also holds scientific underpinnings. The present paper explores the various sources and supporting thoughts of Holistic Education.

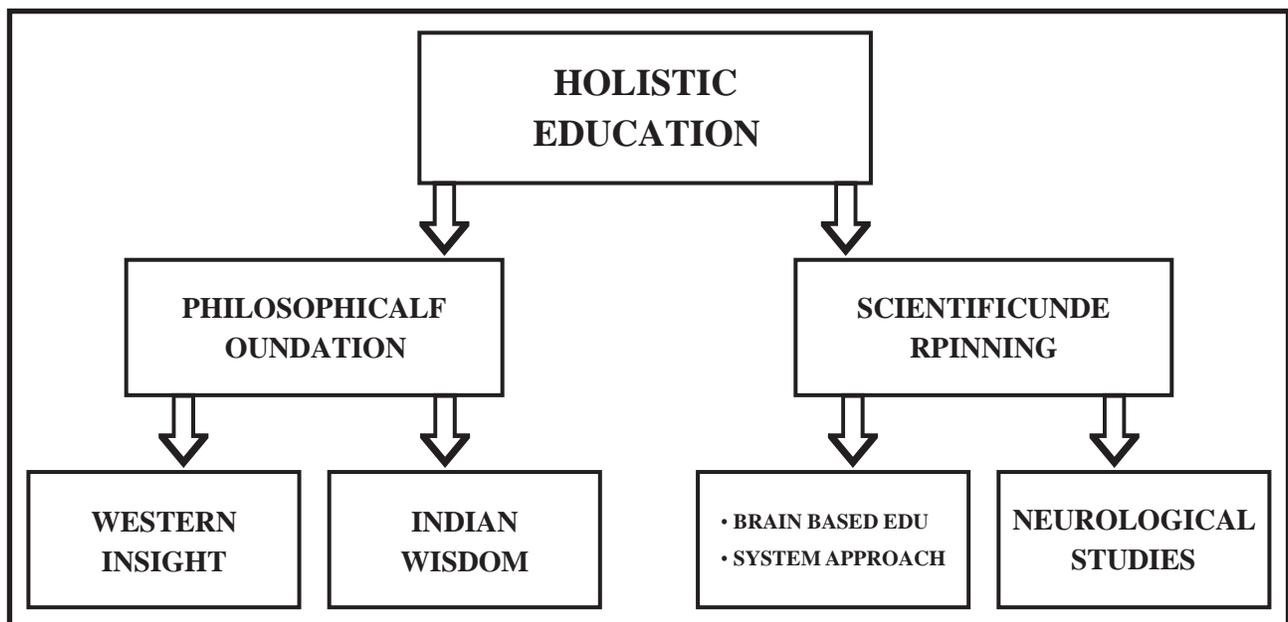


Figure 1. Showing Philosophical foundations and scientific underpinnings of Holistic Education

1. PHILOSOPHICAL FOUNDATIONS:

1.1 WESTERN INSIGHT:

The principles and underlying beliefs upon which Holistic Education is working have many things in common with ancient, mediaeval and contemporary philosophical thoughts. Its roots can be found in ancient spiritual traditions and cosmologies, which have been described as the Perennial Philosophy by Aldous Huxley. Thoreau, Bronson Alcott, and Francis Parker as well as Montessori and Rudolf Steiner, all emphasized the spiritual nature of the human being (Brooks, 2006).

In the educational context Holistic Education is thought to have its origins in the romantic theories of education yielded by Rousseau, Pestalozzi and Froebel. Nevertheless its traces can be found far back in the ancient Greece.

Principles and ideas of Holistic Education are an accumulation from the humanists like Plato, Rousseau, Pestalozzi, Froebel and Tolstoy and from progressive educators like John Dewey, transpersonal thinkers like Emerson, Thoreau, Montessori, Krishnamurthy and many more.

Socrates (470 BCE-399 BCE) can be seen as an advocate of Holistic Education because he advised his disciples to '*know thyself*'. This self-introspection method is considered one of the important tools in Holistic Education. His debate or question answer method which was there for discovering and living the good and virtuous life still holds significance in Holistic Teaching and Learning.

Rousseau (1712-1778) believed in the goodness of child. He said that the essential goodness of child should be unfolded in its natural way. Holistic Education also believes in the goodness of child and natural methods of teaching.

Pestalozzi (1746-1827), the Swiss educator emphasises the importance of classroom and learning environment. The classroom according to him should be a place of meaningful activities. Education is connected with a divine plan and teachers must use their intuitions for this noble act.

Rudolf Steiner (1861-1925; founder of Waldorf School movement) said that '*Soul life*' of children is important which is nurtured in schools. Therefore schools have a vital role to play.

Maria Montessori (1870-1952; founder of Montessori School movement) also talked of nurturing the '*spiritual self*' of the children. She said that each person has a 'Spiritual embryo' and is supported by a divine life. A teacher's role is of immense importance as she has to remove all the obstacles and make the way clear for the journey of spiritual development. Therefore development of learning environment is important to keep the intelligence alive and for its natural unfolding. Her thoughts lay a foundation for Holistic Peace Education.

The core philosophies/ schools of thought which have paved the way for Holistic Education are mentioned briefly in the following table:

Table 1. Philosophies in the background of Holistic Education

PHILOSOPHY	CORE CONCEPTS	ELEMENTS IN HOLISTIC EDUCATION	EDUCATIONISTS (Who took inspiration from these philosophies)
Perennial Philosophy	Recognizes manifold dimensions of reality. Concerned with the oneness and divine reality which is substantial for things, mind and life.	Divine reality, Oneness, wholeness and multiple dimensions of reality.	John Miller, Parker Palmer
Indigenous Worldview	Reverence for spirit, universe and nature, interconnectedness of all beings, piousness of reality, relationship of man with nature.	Veneration for nature, earth, universe and spirit. Interconnectedness Reintegration of man with nature	Rachel Keslar, Gregory Gajeta
Life Philosophy	There exists a fundamental life force or a universal life process which generates and organizes all beings in the cosmos.	'Life' is the core of Holistic Education theory. Education is a manifestation of life which connects it with fundamental life.	Ron Miller, Atsu'hiko Yoshida
Ecological Worldview	Interconnectedness of all beings in universe. Everything is interdependent and part of a larger eco-system.	Ecological literacy Dialogue with nature Interdependence of reality	Edward Clark, David Orr, Ramon Nava
System Theory	Recognizes interdependence of all things. Systematic explanation of dynamic structure of universe. Education is the on going process of universe.	Multiple levels of wholeness Systematic curriculum System thinking and Integrated curriculum	Ron Miller, Edward Clark, Thomas Berry, Atsu'hiko Yoshida
Feminist Thoughts	Caring relations, care for self, surroundings and nature, partnership education, focus on empathy, mutual responsibility etc.	Caring centred education Partnership education Emphasis on peace, respect, empathy, non-violence	Nel Noddings, Riane Eisler

Though 'Holistic Education' arose as a movement in the 1980s it was already prevailing in the thoughts and deeds of thinkers and educators long before in the western world itself.

32 INDIAN WISDOM:

The concept of wholesome living, holistic development and integrated development were existing in Indian wisdom and educational practices since the ages of Vedas. Holistic

Education has found its place in the teaching practices of *Vedic Educational System*, the most ancient educational system of India. Further traces of Holistic Education can be seen in the teaching of *Srimad Bagavad Geeta*. The concepts of *Panch Kosh, Ashtang Yoga* are very much similar to the general philosophy of Holistic Education. Later on thinker and philosopher *Sri Aurobindo* has implemented the concept of Holistic Education in his concept of Integral education.

3.2.1 VEDIKAND THE PANCHKOSHA BASED MODEL

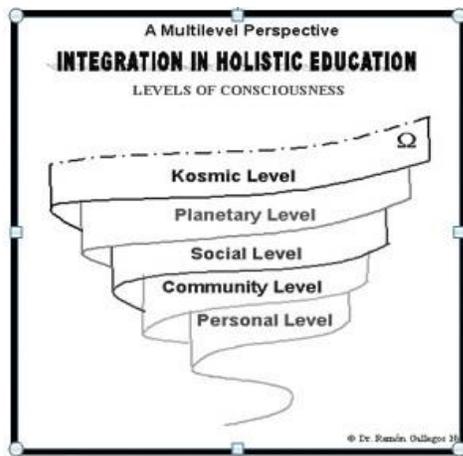
The Indian concept of dharma (religion) is based on the happy and wholesome living of all human beings. Dharma has been defined as ‘*dharmodharyanti*’ which means that dharma is a way to make life happy and wholesome (Sharma 2015). In the Indian Vedic Scriptures the ultimate aim of human existence and of education has always been ‘*Salvation*’/ *Liberation* (from all the bondages) or to be ‘*Swatantra*’. Here ‘*swatantra*’ means *tanra* (essence) of *Swa* (self). Therefore education has this responsibility of developing individuals who are ‘*swatantra*’ and who understand the true meaning of *Swa* (self) in terms of physical, mental and spiritual liberation (Sharma 2013).

Panchakoshas are described in the *Brahmanandavalli* Chapter of *Taittiriya Upanishad* (one of the nine major Upanishads) which is a part of the *Taittiriya Samhita* of the *Krishna Yajur Veda*. Panchkoshas reflect the holistic vision of existence and entirety.

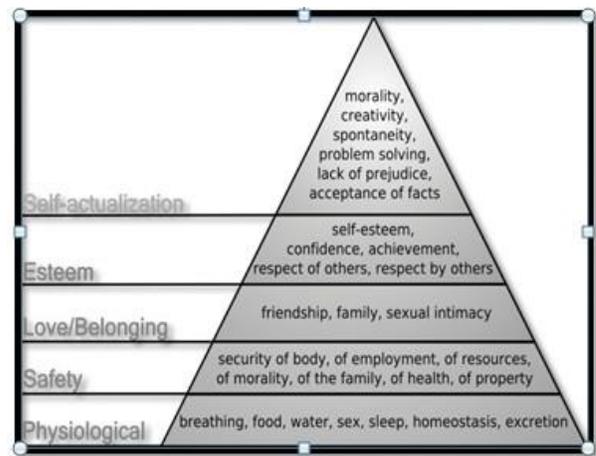
According to Vedantic philosophy ‘*Kosha*’ or Sheath covers the ‘*Atman*’ (soul) or self. There are five (or seven) layers ranging from dense physical body to more subtle levels of emotions, mind and spirit. Human body is only the physical abode of the soul. It is enveloped into seven koshas. Soul remains at the centre of the bliss sheath or *anandamayakosh*. Development of all seven sheaths is essential for individual’s complete spiritual evolution.

The *atman* is behind the Panchakoshas. The Panchkosha-model embodies the hierarchy of human values which is there in Maslow’s Hierarchy of Needs (1943). (Each level of Maslow’s hierarchy outlines a specific category of need ranging from physical to self-actualization, each of which must be accomplished in a bottom-up order.) Dr. Ramon Nava (2000) also presented a model of multilevel perspective, integration of levels of consciousness in Holistic Education.

Panchkoshas doctrine is a useful foundation for a modern scientific understanding of human evolution and Holistic Education.



Dr. Ramon Nava's model of levels of consciousness
(Image courtesy: <https://ramongallegos.com/english/>)



Maslow's Hierarchy of Needs
(Image courtesy: Google image)

Figure 2: Showing models of Human consciousness and human needs

Table 2: Description of Panchkosha

KOSHA	BODY (SARIRA)	FORCE	STATE	DESCRIPTION
Annamayakosha	Gross body (SthulaSarira)	Matter	Physical	Physical body and senses
Pranamayakosha	Subtle body (Suksmasarira)	Vital Air	Energy	Driving force behind the physical aspect of the senses and the operation of the physical body.
Manomayakosha		Mind	Mental	Processing, reason, logic and emotion.
Vijnanamayakosha		Ego and Intellect	Wisdom	Faculty which discriminates
Anandamayakosha	Casual body (karanaSarira)	Centre of Consciousness	Bliss	Independent of any reason or stimulus
Chittakosha		Transcendental	Bliss	Spiritual wisdom
Sat kosha		Transcendental	Bliss	the final state of merging with the Infinite

To nurture and develop these koshas human body interacts with the outer physical world and to its own internal self. These internal and external interactions within oneself and with his

surroundings is done with the help of five elements, five sense organs, five action organs and four tools:

FIVE ELEMENTS (PANCH TATTV)	FIVE ACTION ORGANS	FIVE SENSE ORGANS	FOUR TOOLS
<ul style="list-style-type: none"> • Air • Fire • Water • Earth and • Sky (space) 	<ul style="list-style-type: none"> • Mouth • Hands • Legs • Excreting and • Sex organs 	<ul style="list-style-type: none"> • Eyes • Nose • Ears • tongue and • Skin 	<ul style="list-style-type: none"> • Manas (mind), • Buddhi (Pure intelligence) • Chitta (Creative energy) and • Ahamkar (ego)

The high idealistic aims set by the Vedantic philosophy and the above mentioned organs help in the acquisition of 'Aparavidya' (worldly knowledge) and 'Para vidya' (Spiritual knowledge) (division of knowledge as Apara and Para in *Mundkopenishad*). All this leads an individual to the *Sthithpragaya* stage and the attainment of *Sat-Chit-Anand* (Harmony, Creativity and Eternal Peace).

3.2.2 VEDIC EDUCATION SYSTEM AND HOLISTIC EDUCATION

It was the first ever system of education in India spreading from 1500 to 500 C.E. based on the principles of idealism and teachings of Vedas (the original and most authentic source of wisdom and knowledge in India).

Virtuous life and attainment of salvation were of utmost importance and education was

the medium of it. Education was planned to nurture body, mind and soul. Character formation and all round development of personality were the aims of education. Along with them inculcation of social, moral and civic values were considered important.

Teachers exhibited the ideal examples and they were the role models of the disciples. Through the close relationship between the teacher and the taught, qualities of love, care, sympathy, self-respect and confidence were inculcated in the students. In the *Gurukuls*, students received very kind and sympathetic treatment. There was no room for punishment. Gurus used very gentle language and polite tone. Very cordial and respectful relationship existed between *guru* and *shishya*. Self-discipline was focused. Teaching-learning methods were Sravana (listening), Manana (contemplation) and Nididhyasana (concentrated contemplation).

3.2.3 ASHTANGYOGA

(EIGHT LIMBED YOGA)

The *Yoga Darshan* (Eight fold path) propounded by sage Patanjali provides ways to nurture the koshas, enlighten the self and to unite with the divine entity. Its roots are around 5000 years back as described in *Vedas*. It is the art and science of pure life style and helps in the development of body, mind and soul. Yoga is defined as “the controlling of the mind” (chittavrattinirodh). It evokes the hidden potentialities of man. Sage Patanjali talks about AshtangYog (eight-limbed yoga):

1. Yam- code of conduct for sense organs
2. Niyam- purifying and strengthening actions and sense organs
3. Asana- physical postures
4. Pranayam- regulation of pace and rhythm of prana (breathe control)
5. Pratyahara- Withdrawal of the sense (sense control)
6. Dharana- Focusing or Concentration
7. Dhyana- Meditation
8. Samadhi- Super consciousness (absorption into the universal)

The Yoga darshan is in itself a complete way of leading a happy life; attaining wholesome development of physique, intellect and consciousness. Beginning with Yam and going up to Samadhi, an individual embarks on a journey; he passes all the phases from physical being to the super conscious being and unites with its infinite source from where it came. Thus Yoga Darshan provides a very strong groundwork to Holistic Education.

3.2.4 BHAGWAD GEETA &

HOLISTIC EDUCATION

Bhagwad Geeta is a part of *Mahabharata*, the great Indian epic. Literally it means ‘a divine song’. It was composed by *Rishi Vyas* in the form of intellectual and philosophical discourse between *Krishna* and *Arjun*. Geeta presents valuable thoughts on educational process and its stakeholders.

All round development of individual, removal of ignorance and establishment of rapport between the individual, society, universe and universal principles are the chief

science, technology and sense of responsibility.

Aurobindo says, *'nothing can be taught'*. Everything lies within the soul. Education just unfolds it. It integrates one with one's true self, surroundings, society, nation and humanity. *"The new aim is to help the child to develop his intellectual, aesthetic, emotional, moral, spiritual being and his communal life and impulses out of his own temperament and being,"* says SriAurobindo. (Aurobindo, 1928)

Sri Aurobindo gave a concrete shape to his thoughts in the form of ICIE (Indian Council for Integral Education, founded in the year 1860) and 'Sri Aurobindo Foundation for Integral Education and Research'.

Integral Education in its simplest form caters to the physical, emotional, mental and spiritual domains, these systems are interrelated and interdependent hence cannot be separated.

According to Sri Aurobindo child is not just flesh and blood but a growing soul. This kind of education helps the child to develop and grow to his fullest and best. So that he attains healthy and strong physique, sensitive heart, sense of responsibility, strong will power, intelligence and spirituality. *'The most precious gift you can give to a child is the love of learning'* stated by The Mother who was Sri Aurobindo's disciple and spiritual companion. (Sri Mataji, 1920)

Rabindranath Tagore, Mahatama Gandhi, S. Radhakrishnan, J. Krishnamurty and Gijubhai were the staunch supporters of Holistic Education in India. In the western world Ron Miller, John Miller, Paulo Friere, Ramon Nava, R Martin have strongly supported Holistic

Education. At present Ontario Institute for Studies in Education at The University of Toronto, The Holistic Teaching/Learning Unit at The University of Tennessee at Knoxville, Krishnamurty Schools: The Valley School, Bangalore, Rishi Valley School, Chennai, Rajghat Besant School, Varanasi, Pathashaala, Chennai, ManthanVidhyashram; A school for holistic education, Aurobindo Educational Foundation, the Brahmakumari Institutions and Ramakrishna Mission Vidyalayaare the leading centres of Holistic Education worldwide.

1. SCIENTIFIC UNDERPINNING OF HOLISTIC EDUCATION

Holistic Education is the need of the hour. Eminent educationists, thinkers and philosophers have been providing methods, thoughts and reasons for its immediate implementation. They all agree that man is an integrated whole, a complete unit having different facets. But these domains are not water tight compartments. Rather they complement and supplement each other. They interfere in each other's region and hamper or encourage each other's functioning. Best learning is only possible when all these domains are utilized, nurtured, activated and make the best combined effect.

All this is now scientifically proven. The Brain based learning and system theory work upon the same principles. Neuroimaging is the latest emerging field for research and educational opportunities. Neuropsychologists and researchers are time and again presenting facts and findings regarding the interference and

interdependence of various brain regions in performing a particular function. Cognitive, emotional, moral or social functions use more than one brain area/region. They constantly affect each other in positive or negative ways depending upon the nature of the task and individual's physical, emotional and cognitive status. The more complex the function, the more brain regions it includes.

This section briefly discusses 'Brain Based Education' and 'System Approach' which share the same thought as Holistic Education.

4.1 BRAIN BASED LEARNING

The human brain is endowed with most developed mental faculties and this is what differs and keeps him at the top of the pyramid. Human brain has the ability to shape and mould it through its interaction with the environment.

The process of education ultimately, is an endeavour to change the human brain. If teachers learn about the physiology and functioning of brain, they can be more successful in shaping it, giving it the right direction and in discovering the hidden potentials in a far better way. (Sousa 2006).

Brain based education is defined as *the engagement of strategies based on principles derived from an understanding of the brain.* (Jensen 2008).

Brain based education relies on the principle that brain is a multi-tasking organ and can perform several tasks simultaneously (Caine & Caine 1995; Barnard et al., 2007; Robinson, 1998).

It is really thoughtful that when different parts of human brain function together and perform multitasking simultaneously how can teaching learning be fragmented or single domain focussed.

Study of brain and Brain Based Education provide a scientific and logical backing to Holistic Education. Study of brain shows that although every brain is unique; yet every brain perceives and functions as a whole, its various parts affect and are being affected by each other, brain functions as a whole, simultaneously. Brain is a parallel processor which processes parts and whole together. Therefore our teaching learning should also be multidimensional, involving different domains of an individual because learning engages physiology and emotions both.

Cognitive learning is a mental process for seeing, memorizing, organizing, processing, thinking, and solving for particular issues (Madar, Had, Razzaq, & Mustafa, 2011). By contrast, **brain-based teaching and learning takes a holistic approach, looking at teaching developmentally, socio-culturally, and in other broad ways (Caine & Caine, 1995).** Brain-based learning takes into account the whole child by differentiating instruction and creating ways to meet the needs of the individual students.

Three domains of learning as described by B.S. Bloom (1960) Cognitive, Affective and Psychomotor can be better dealt using the brain based teaching learning strategies.

If children are literally formed by their experiences, not just by memorization, then a teacher who knows how to fascinate students into wanting to write, read, play music, and discover the physical world can create miracles (Caine & Caine, 1997).

A teacher enters the classroom with preparation, experience, and a hope that what he is going to teach, students will understand and remember it and will use in their lives. Realization of this hope depends largely on the knowledge of teacher in planning and preparing the lesson and more importantly selection of teaching learning strategies according to brain based theory. If teachers plan and prepare the lesson keeping in mind the various faculties of brain, they would hit the target of holistic teaching directly and indirectly.

4.2 SYSTEM APPROACH

System can be best described through the old philosophical saying; ‘Whole is greater than its parts’. A System is “any arrangement or combination, of interacting parts or elements, in a whole” (Bertalanffy, 1968). System is a holistic way of viewing things. It believes that whole is made up of separate parts, but those parts are not separate entities or they do not exist in vacuum. Rather they are tied together, work together to make a combined effect.

Cyrs and Lowenthal (1970) define systems approach (when applied to education) as a “...rational problem solving method of analyzing the educational process taken as a whole, incorporating all of its parts and aspects, including the students and teachers, the

curriculum content, the instructional material, the instructional strategy, the physical environment and the evaluation of instructional objectives”. It leads to the goal of holistic learning and integrated development of various domains of personality.

The concept like ‘systems’ and ‘system approach’ in education have been often deliberated on by Bern (1967), Bason and Heinich (1966); Kaufman, Corrigan and Manch (1962), Silvern (1963), Hayman (1974), Mithell (1975), Lehman (1963), Shoemaker (1972) and many more.

System approach places immense importance to the relationships among various parts of the system as well as their relationship to other systems in the environment. In the educational field also a systemic perspective needs to be taken to deal and solve its problems successfully.

System approach shares its roots to Holistic Education in the context of ‘*Whole and the interconnectedness of its parts*’. System approach like Holistic Approach believes that whole is greater than its parts, and the parts are not separate entities. The purpose of implementing system approach in the field of education is the achievement of Holistic development of the individuals.

4.3 NEUROLOGICAL STUDIES

SUPPORTING HOLISTIC NATURE OF LEARNING

From ancient to modern, from philosophy to practice and from religion to science all wise people advocate, support and call for Holistic

Education. The field of neuroimaging has opened up plentiful possibilities and opportunities in the field of educational research also. It is astonishing to take picture of thinking and learning brain and then drawing conclusions based upon that. Science and technology has made this happen. Brain is a real time processor and its functions can be best studied with tools that help in tracing the real time neural activities with specific brain regions (Hari et. al. 2000). Various imaging methods to look into the brain are Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI), functional Magnetic Resonance Imaging (fMRI), transcranial Near-Infrared-Spectroscopy (NIRS), Electro-encephalography (EEG), and Magnetoencephalography (MEG).

Brain studies using neuroimaging methods have proved that brain function is largely implemented in a network, brain regions do not function independently rather they interact and exchange information and this is how a specific function of brain is performed. Therefore they go in consensus with the general philosophy of Holistic Education. Unlike the human body,

brain is also a single entity which works as a whole.

The neurophysiological studies do not accept the Cupboard Model of brain according to which different functions (cognitive and motor) are located in specific drawers (regions of brain). Pinpointing one brain region for a specific activity means only that particular area is activated during the process. But this is not always true because higher mental abilities and complex cognitive processes show interconnectedness and interdependence of different brain areas. Studies on retention, perception, imagery, working memory, language, priming and semantic and episodic show that complex cognitive performances require interconnectedness and coordination of different brain regions (Cabeza & Nyberg 1997, 2000).

Cognition cannot be understood as a single process, but as a set of well-designed performances and behaviours and daily living accomplishments which come from brain activities (Dixon & Nilsson 2004).

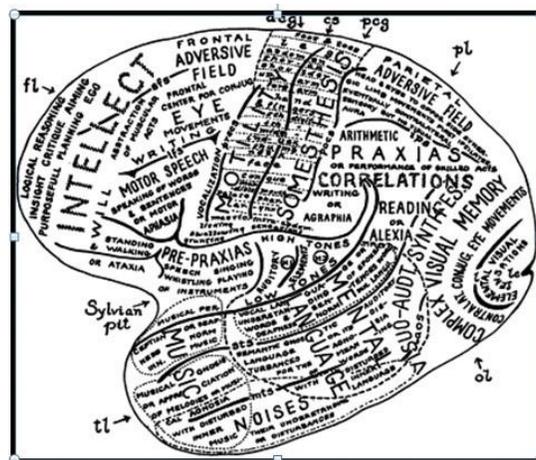


Figure 3 : Localisation of psychological functions in the human brain according to Polyak (1957), reproduced by Savoy (2001)

Table-4 : Showing Brain areas and their corresponding activities

ACTIVITIES	BRAIN AREA
Intellect, executive functioning, thinking, planning, organizing and problem solving, emotions and behavioural control, personality	Frontal Lobe
language processes, memory, understanding	Temporal
Regions visual information processing	Occipital Lobe
motor functions, movement	Motor Cortex(central areas)
Sensation	Sensory Cortex
Perception, making sense of world, arithmetic, spellings	Parietal Lobe

Most of these associations between brain regions and cognitive/psychological/motor functions are still valid. Contemporary researches and functional topographic maps make use of these (Nichols & Newsome, 1999; Savoy, 2001).

Brain regions are interconnected not only in different cognitive functions, but they affect and are being affected by emotional, physical and psycho-motor activities also. Studies have revealed that emotions can improve or hinder learning, retention and long term memory. Cognitive and emotional processes are said to be highly interrelated (Dewey, 1894; Parrott & Sabini, 1989) (as cited in Storbeck and Clore 2007).

This has been proved in laboratory findings as well as everyday observations. To keep these two phenomena separate would neglect the richness of mental life (Roediger, Gallo, & Geraci, 2002, p. 319). Therefore they should not be divorced (Adolphs & Damasio, 2001;

Barnard, Duke, Byrne, & Davidson, 2007; Halgren (1992).

Halgren (1992) and Nishijo et al. concluded in their studies that when “the amygdala performs emotional evaluation, it does so within the cognitive system. This could explain why it has been so difficult to dissociate emotional from cognitive processing in humans”. Latest neuroimaging findings have also indicated that the amygdala and prefrontal cortex cooperate with the medial temporal lobe in an integrated manner making LTM (long term memory) retention and learning successful. Amygdala determines the urgency of the stimulus to help in marking of apparently important experiences hormonally and in terms of experienced arousal and in retrieving the affective value of stimulus. Yet it is noteworthy here that amygdala is not the only region responsible for emotional processing to modulate cognition. The Visual Cortex plays an important role too. Studies also reveal circular emotional control and cognitive

regulation (bottom-up and top-down influences) within the brain to achieve optimal integration of emotional and cognitive processing.

Neurological studies show that academic tasks such as tests, examinations, homework, and deadlines are linked with different emotional conditions that include frustration, anxiety, and boredom. Emotions are also influenced by the subject matter that affects one's capability to learn and remember.

4.3.1 RESEARCH EVIDENCES:

Recent brain research indicates that the brain searches for patterns and interconnections as its way of making meaning. Researchers theorise that the human brain is constantly searching for meaning and seeking patterns and connections. Authentic learning situations increase the brain's ability to make connections and retain new information. (CCEA, 2003b, p. 3) (as cited in Purdy & Morrison 2009).

Proffitt and Colleagues (1999, 2003, 2004) found that cognitive functions are affected by physical and emotional well being. In their experiment they concluded that participants with reduced physical resources, heavy luggage, physical fatigue and increasing age perceived the hills as steeper and at farther distances.

In another study Rieneret et al. (2003) conducted an experiment in which participants standing at the bottom of a hill were made to listen happy and sad music and then their cognitive functioning and response were studied. Sad students perceived mountains out of molehills and they overestimated the incline

on verbal and visual measures as compared to the happy participants.

The Moral Functioning of individual also makes use of some parts of the cognitive and emotional brain regions depending upon the nature of moral activity such as moral judgement, social norms and values, others beliefs and intentions. No brain region is uniquely devoted for moral functioning.

Kohlberg characterized a landmark in the psychological study of morality (Kohlberg, 1963, 1984) by concluding that moral reasoning is a result of cognitive processes which may exist even in the absence of any kind of emotions. Though it was strongly challenged and later researches in psychology (Trivers, 1971; Pinker, 1997; Flack and de Waal, 2000) found that emotions play a crucial role in human morality (e.g., kin altruism, reciprocal altruism, revenge).

Morality is a set of complex emotional and cognitive processes that is reflected across many brain domains. (Pascual, Rodrigues and Pujol, 2013). Probably there is no specific brain region for moral functioning. The neural circuits of brain regions occupied in moral functions are the ones used in cognitive and emotional tasks. Like the inferior parietal region which is mainly associated with working memory and cognitive control is used in some moral activities also. (Greene et al., 2004; Harenski et al., 2008; Cáceda et al., 2011)

The amygdala is considered an essential structure for moral learning (Mendez, 2006) and it is also engaged in the evaluation of moral

judgments (Greene et al., 2004). At the same time amygdala plays a significant part in the processing of emotional processing involving moral judgment. The ventromedial prefrontal cortex (VMPFC) is constantly involved in moral judgement (Greene et al., 2001; Moll et al., 2002; Harenski and Hamaan, 2006; Koenigs et al., 2007; Prehn et al., 2008; Harada et al., 2009). VMPFC also plays an important part in the mediation of the emotions engaged during moral processing (Young and Koenigs, 2007). It is also involved in adherence to social norms and values (Moll et al., 2005) and in the integration of representations of others' intentions with their outcomes during social decision-making (Cooper et al., 2010).

Similarly we have a 'Social brain' also (parts of brain engaged in social activities). It includes Medial prefrontal cortex, superior temporal sulcus, temporal parietal junction, temporal pole and other regions. These brain regions are called the social brain. (Brothers, 1990; Gallagher and Frith, 2003; Frith and Frith, 2006).

Medial prefrontal cortex; which was involved in moral activities also, is an important part of the social brain engaged in the '*mentalizing*' process. Mentalizing is the mental activity of speculating about the mental states (intention, emotion, belief, etc.) of others (Frith and Frith, 1999). The process of mentalizing is fairly important in leading a normal social life and in interacting with different people (Morita, Asada and Naito 2016).

1. CONCLUSION

The above mentioned researches compel us

to think that when the human brain perceives things as a whole and works as an integrated unit than why our education system only focuses on cognitive domain. The reason may be again found in the contemporary materialistic driven human nature and unnecessary weightage to economic and wealthy aims of living.

It is high time that we truly accept what our old sages have said long before, what the educationists have been trying to convey and even proved by the neurophysiological studies also. The educational procedures, methods and curriculum need to consider the amalgamation of all the dimensions of personality. Education must be designed in a way that various dimensions of personality are considered and enriched in some or the other way. This will produce individuals who would be academically enriched, emotionally balanced, socially acceptable, morally uplifted and spiritually enlightened.

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