

Teaching Important Moral Values to Students Through Science

Values, Satya, Dharma, Shanti, Prema and Ahinsa

In the initial stages there was no compartmentalisation between Science and other kind of knowledge but as more as discoveries and inventions were made, the spirit of specialisation evolved and scientific discoveries were classified under one or other of basic Sciences viz. Physics, Chemistry, Biology, Astronomy and Genetics etc. In due course the progress and proliferation made in Science became so vast and fast that all almost 90 percent of everything we know in the Science has been generated in the last fifty years. The scientific discoveries and technological inventions have accelerated the process of social change reducing the World to a global village. Science and technology promise a better way of life and material satisfaction and gives hope of genuine optimum and excitement.

Dr. Shalini Singh
Assistant Professor,
Department of Education,
V. M. L. G. College Ghaziabad

Teaching Important Moral Values to Students Through Science

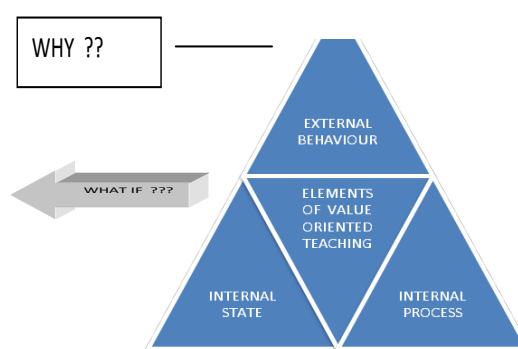
From the point of view of Philosophy there are five cardinal values viz. Satya (truth), Dharma (religion), Shanti (peace), Prema (love) and Ahimsa (non-violence) while point of view of meaning values are connotation in subject teaching. Among five cardinal values each value has equal importance and separate meaning. Satya means sincere pursuit of the whole truth. Dharma means duty towards society. Shanti means perceiving harmony in nature. Prema means total understanding. Ahimsa means practising all above in daily life.

The practice and percept of these values will link us to the core of our being and the within. There is need to remind our selves of this inner core and to draw strength from that conviction is Education in Human values i.e. 'Educare'. That is why we need to focus upon these values constantly and regularly. We should correlate human values with Science teaching so that it might be able to orient the modern students the ancient cardinal values in them. Since the origin of the whole World is from the primordial single undivided energy (The Big Bang theory). All the branches of Sciences for that matter whether it be Science or spirituality, both deal with the same subject. An individual looks within and perceive the cause i.e. Spirituality while another individual looks without and perceives the effect i. e. Science. Science is really the pursuit of truth therefore the student of Science develops an ability to discover measure and analyze the tangible unless his training is not to be called as complete. Science explains and glorifies the external world without giving a fleeting mention of the substratum- the foundation and the cause of events. Therefore the actual pursuit of Science should give adequate attention to the basis of existence of the World and build a stable structure of it. Hence, we only need to change our perspective of reality and accept a more holistic approach towards bridging the gap and to reach within and contact this external

source of Bliss.

As defined earlier that values are connotation in subject teaching. Since sincere pursuit and incisive thinking are as the brick and mortar for the super structure if Science. Questioning, what we perceive, posing questions such as what, why, how and what if are essential for deep appreciation of the subject. Unfortunately, most of the school level, postgraduate level and to some extent even the post graduate level teaching of any subject focuses only on what and how aspects of all that we perceive. In other words these are content explaining i.e. The external behaviour (What?) and the internal process (How?) neglecting the internal state (Why?) and the day to day application (What if?). So the inclusion of neglected perspectives should be added with main stream of education of all subjects. The connotation should also be defined in each subject because these are the essential elements for values.

Model Of Value Oriented Teaching Of All Subjects:



It is clear through the model that external behaviour is the resultant of internal state of mind and processing of ideas of an individual in it. Thus three elements are responsible for value oriented teaching viz. internal state, internal process and external behaviour of an individual. Internal state answer the words 'Why' and 'What if' that means

it focuses on reasons and implications of acquired knowledge, internal process focuses upon methodology to achieve knowledge of values so it may be said that it searches the answer of the word 'How' while external behaviour is the by product after processing of ideas of an individual so it connotes the word 'What' and guides an individual to react according to stimulus.

How to Teach Satya Through Science: Satya is really a self Knowledge. Here it is defined as sincere pursuit of reality. It has 4 connotations in the subject teaching namely:

- 1 To perceive the underlying unity.
- 2 To develop a sense of awe and reverence towards nature and natural processes.
- 3 To perceive a design and harmony in nature.
- 4 To derive lessons from nature.

When we address above aspects of any topic we are in effect practicing Satya in teaching and also impart this value in the students. This fact is applicable to all subjects. Any subject could be analyzed from this angle since that subject is only another perspective of the same reality. The researcher is discussing the ways of above four connotations one by one.

When we teach allotropes of Carbon in Chemistry we need to draw the attention of students to the underlying unity that whether it is invaluable Diamond or worthless unless both are made of Carbon similarly while teaching polymers in Industrial Chemistry we need to draw attention of students to the fact sugar, starch, paper, textile or bread all are made up of three atoms namely Carbon, Hydrogen and Oxygen. The difference is only in the external form. At the atomic level there is an underlying identity. In Upanishads it is written that all the pots whether it is pot or plate are made up of clay. On the basis of these examples it is clear that not much more importance should be given to the exterior shape. Thus, the underlying unity and the value of avoidance of greed could be taught to the students.

To teach underlying unity through Biology a teacher can quote an example of the biochemical

reactions Glycolysis or Kreb's cycle are common to all cells of living organisms. In another kind of explanation is that all men are cells in the same Divine body of Divine organism. Thus, the underlying unity and the knowledge of the same primordial energy lives in many bodies can be imparted to the students.

For developing a sense of awe and reverence towards nature and natural processes a teacher can take an example from molecular biology that polymeric units are bounded with partial double bonds give necessary rigidity and flexibility and single bonds present in the structure give birth to acid derivatives. A person may think of in his mind that all derivatives of such structure will be awesome for the society yet it is not at all. Thus, this approach of the entire creation ordered by a single force leads to perfection along with it and a sense of adoration and awe at the natural process and makes a feeling of humbleness among students. Hence, a core value of humility and reverence develops in us.

For developing a design and harmony in nature a teacher can quote an example from Chemistry that bricks and mortar are the basic elements for any stable structure. Thus, the knowledge of some binding force and harmony in nature can be imparted to the students. From biology an example of the macromolecule which is made up of a number of micro molecules are bounded with some force for the purpose of molecular recognition to form a rigid structure termed as frozen. The term frozen means that cannot be separated in its physical form after recycling it. Thus, the value of unity is strength can be taught to the students.

To derive lessons from nature a teacher can take an example of the periodic table from chemistry and explain that there is basic difference in metal and non- metals that metals have strength, lustre and some other physical properties while non- metals are brittle(weak) and do not have any lustre. The strength and lustre of a metal is due to property of giving electrons to another element

while weakness and lustreless coating of non-metals is due to property of taking electrons from other elements. Thus, it will become clear to the students from the example and they can derive a **conclusion** that giving property will make them **strong** and **prosperous** while taking property will make them **weak** and **non prosperous** from the point of view not only from money but also in satisfaction, fame etc.

If a teacher takes an example from biochemistry that an amino acid is bitter in taste but when its molecules are joined with each other they form proteins and as we know that proteins are sweeter in taste although it is made up of same amino acids which are bitter in taste. Thus, the students can derive the **conclusion** that if they will live with unity they could be **more useful** to the society and their **individualistic limitations get nullified**.

How to teach dharma through science:

Dharma has four connotations such as—

- Day to day application of the concepts.
- Industrial uses of the reactions or by- products.
- The beneficial and harmful effects of chemicals.
- Our duty towards nature.

When we address these aspects we are practicing dharma in teaching and also impart this value to the students. The researcher is discussing the ways of above four connotations one by one.

To teach day to day application of the concepts it is necessary for a teacher to extend this knowledge through the explanation of common occurrences. The teacher can put some question before students such as- Why does milk boil? How does an automobile run? Why does cement become so strong in a while? Etc. These examples will certainly kindle keen interest for finer aspects of the subject and awareness among students that all knowledge is of practical relevance. Thus, students will learn the ability to apply his knowledge in day to day life.

A teacher should teach industrial uses of the reactions or by- products different reactions related to Science and tell about the by- products

of reaction. For teaching this he can take students to different industries to impart real knowledge or he should present practical in the laboratory. Thus, students will be oriented towards real knowledge and will accept only reality and become able to break-the superstitions created by dharma.

It is a duty(Dharma) of a teacher that he should tell about students through Science the beneficial and harmful effects of chemicals, reactions and their by- products. As it is said by someone that incomplete or some knowledge is dreadful. Thus, the teacher will be successful in orienting students to get complete knowledge of any subject.

A teacher should orient to students towards their duty towards nature and the mother Earth. He should tell about that how they can be useful member of the society by using their constructive approach to conserve the natural resources and creating peace in the world. That is why he should quote examples of bad and good uses of Science. Hence, the value of constructivism and creation of peace be imparted to them.

How to Teach Shanti Through science:

As it is defined above that Shanti or peace is really the harmony with nature. It has two connotations such as-

- Perceiving a design and harmony in nature.
- Study of symbiosis and synergy.

When we address these two aspects of any topic we are practicing Shanti in teaching and also impart this value to the students. The researcher is discussing the ways of above two connotations one by one.

There is an element of aesthetic value even in rational scientific approach. A teacher should force to students to see the beauty of nature for perceiving a design and harmony in nature and quote some examples of biological processes as Photosynthesis occurs due to green colour and tell students that greenery of nature is due to this green colour and it is also important to fulfil the

basic need of hunger of all people of the World. Thus, the teacher will be successful to give a message **not to cut the trees** because these are foundation of our existence on the Earth. Hence the value of **right perception** towards everything provided by nature is inculcated in students.

To create the peace in the World a teacher can present examples of Biology. He should quote that Lichens are the best example of symbiosis and synergy. Actually Lichens provides shelter to fungi and in reverence fungi gives nutrients essential for the growth of algae. Thus, both get benefitted with each other. Hence, the messages of **maintaining** peace in the World certainly provide easy life as well as good environment for existence in the World and in reverence the nature will facilitate the whole humanity.

How to Teach Prema Through Science:

It is really love with knowledge. As Words worth has said that love enables to see new things, discover new forms and gives you the peculiar delight that comes to one who has seen the reality. Love is the fundamental requirement for the pursuit of any endeavour. It is the undercurrent of all the human values. A teacher can take up an example of the great Scientist of Physics namely Newton once who saw an apple falling from an apple tree although so many people had seen the event so many times yet nobody had thought about the reason. This great Scientist devoted his whole life in search of the reason for the same and ultimately he got success in finding gravitational force- as the reason. Thus, the value of **love with knowledge and ultimate success of labour** be inculcated among students.

How to Teach Ahinsa Through Science:

It is also a tool for creating peace and maintaining it for a long time in the society. If a Science teacher is not misusing his power for beating students for mistakes committed by them then we are practicing Ahinsa (Non-violence). A good Science teacher brings this quality in his nature. If a student asks the same question many times with good intention then teacher should

reply without anger until the student does not get satisfaction. For orientation of this value firstly the teacher should represent himself as an ideal in adverse situation. Through Science he should take up examples of biographies of great scientists and emphasize such events. Thus, the value of applying **non- violence in daily life** is inculcated among students.

Conclusion:

The aim of all kind of education must be to study reality in order to realize the experiences of all aspects of life. In normal secular mode we just only read the subject and draw some conclusions and establish new principles without experiencing any joy from it. Rather than this if a student from does the study for seeing them all as perspectives he will reach to the principle of delight and principle of 'Education for happiness' will also be followed by the student. Thus, the student will get the real joy that is Sat-Chit- Anand and will be able to live a blissful life even in the running World.

References:

1. Schilpp A.P "The philosophy of Radhakrishnan" published by Harper & Row publishers, New York, II ed., 1963
2. Dhyaneswar Maharaj "Gita the Mother" published by Kalayani publishers Ludhiana, 1972.
3. Bhakti Vedanta, A.C. & Swami Prabhu Pad 'Bhagavadsandesh' published by Bhakti Vedanta Granth sansthan, Bombay vol.I, 1986.
4. Bhakti Vedanta A.C. & Swami Prabhu Pad 'Bhagavadsandesh' published by Bhakti Vedanta Granth sansthan, Bombay vol.II, 1986.
5. Tattavabhuhan, S "The Bhagavadgita" published by Cosmo Publication, New Delhi, 1987.
6. Shivanand: "Gita Rasamrita" published by Sarvasewa sangh Prakashan Rajghat, Varanasi, 1997.
7. Singh, Vijender (2014). "Value Education" published in Naval Shodh – A peer reviewed bilingual international Journal of Humanities & Social Sciences, published by NK BMGC, Chandausi, vol.2, Dec. 2015, ISSN No. 2394-3556
8. saidarshan.org
9. shodhganga.inflibnet.ac.in
10. www.sssbalvikastn.org

