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Holistic Education and Research (HEAR)

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Na Hi Jnanena Sadrusham Pavitram Iha Vidyate – there is nothing on this earth which is equivalent to Knowledge in purity. Purity can be taken to imply **importance** or **values** and hence can be made mandatory. It is therefore naturally imperative that we have a Knowledge based Society, where, intellectuals, academicians, teachers, are revered and sought after for advice. Order in society has given way to Wealth in place of Knowledge. Money and wealth are seen to be driving the Society, and this as we witness today, has led to corruption, exploitation, chaos and loss of virtuosity.

What is this Knowledge, what is it about, how do we get it and how do we sustain it? The answer to this question would depend on the context, in general. The focus presently is on peace, harmony and development in the Society to which we all belong. Education and research are two essential components of any thought that aims at achieving these objectives. Research creates new knowledge, adds new dimensions to the existing knowledge, while education prepares an individual with the minimum knowledge required to work on the above objectives.

In the context of the fore-mentioned objectives knowledge can be categorized into two Professional types: Natural Sciences based and Social Sciences based. The former includes engineering, technological, and medical fields as well. The ***value system*** which distinguishes the 'right doings' from the 'wrong doings' is common to both the disciplines. There are also many commonalities between the two. We shall elaborate on these aspects separately in the following paragraphs.

Social Sciences based Professions such as law, administration, planning, psychology, economics, history, geography, commerce, and the like, are related to human behavior and relationships, communication, global parameters, available natural resources like, water, fuels, ecosystem, minerals, land, food, etc, and also to traditions, cultures, in the Society. These factors directly influence peace and harmony in the Society. Laws have to be followed by the administrators for maintaining social order. Laws have to be framed keeping in mind impartiality, justice, appropriate use of the available resources, benefit to the mankind – in fact all species - in general, and harmony within and between the communities. One has to understand the do's and don'ts; not only one has to be aware of his/her rights in the Society, but also be conscious about the duties and responsibilities towards the Society.

Natural Sciences may be classified into four subjects, namely, Physics, Chemistry, Biology, and Mathematics. ***Physics deals with properties and dynamics in the inanimate world.*** Newton's laws of motion, law of gravitation according to which two objects with mass attract each other and this governs planetary motions in space, Astronomy and Astrophysics which help understand our solar system, stars, galaxies etc, Earth Sciences or Geology which are related to earth-quakes, volcanos, etc, properties of materials which are used in our daily life, energy generation are some common examples. ***Chemistry deals with interactions among the various inanimate objects.*** Formation of molecules from atoms, synthesis of various compounds used in items of daily use such as soaps, toothpastes, paints, plastics, clothes, paper, cosmetics, inks, drugs, etc are some of the common examples. ***Biology deals with behavior and functioning of the living objects.*** How does a single living cell from a mother develop into a full human being? How do plants synthesize food? What causes diseases and how can they be cured by use of drugs? How does the food, we eat, get metabolized to form blood, flesh, bone etc? What is memory? What is reproduction and why do the off-springs resemble their parents in some manner? And so on. ***Finally, Mathematics provides the abstract concepts which are useful in all the other three fields.*** Number system, algebra, calculus, analysis, statistics, are some of the most familiar terms. Computer science, often clubbed together with mathematics, has revolutionized various operations, enhanced computational speeds, enhanced precision and control of parameters in various experiments. A knowledge of all the four fields – could be more in some and less in some other depending upon the profession - would be required for any of the professions mentioned above.

Education and research in the above subjects leads to developments which directly affect our lifestyles. For example, invention of the refrigerator, which allows us to preserve cooked food for long periods of time without deterioration changes the way we plan our daily routines. Pressure cookers have reduced the time required for cooking the food so that one will have time for other tasks. Liquified Petroleum Gas (LPG) and electricity based operations are clean, pollution free, and these directly affect our health conditions. Invention of wireless transmission which is the basis of the mobile phones, has enabled information transfer – both text and images - across the globe at incredible speeds (matter of seconds) and thus has essentially made the world shrink (metaphorically). These have also influenced many of our daily functions such as purchases (online purchases), bill payments, transportation, providing physical security by monitoring through CCTV cameras, weather forecasting which is useful for agriculture, detection of storms in advance so that precautionary measures can be taken to avoid damages to life and property, to name a few. Many gadgets and equipments have been developed to monitor our health conditions – body temperature, blood pressure, heart rate, sugar level etc – diagnose disease conditions such as tumour growths, infections and so on, facilitate medical treatments, help develop drugs for specific diseases etc. These are only few illustrations and the list can be very long. On a larger scale

one can mention achievements such as Satellites which provide global images of the earth at high resolutions, landing on the moon, Mars missions, development of Missile and other defense equipments etc, are huge operations involving participation of thousands of scientists and engineers.

The Natural Sciences based outcomes are highly quantifiable and can be subjected to serious scrutiny by others in the field. If a scientist has made an observation, he has to make sure that nobody else did it before him and, if indeed, someone else had made a similar or a related observation, that has to be acknowledged and due credit be given. The experimental details and the results of the experiments have to be truthfully reported for others to follow, and to repeat the experiments, if they wish, to verify the correctness of the experiments and the derived results. In scientific endeavors, the experiments are, often, curiosity driven, and the social benefits may not be immediately apparent. Innovations on these results lead to technological advancements which would benefit the Society. Whatever be the nature of the endeavors, mistakes do occur, since while planning the parameters for the experiments one may not be aware of all the factors that may influence the results. These will have to be forgiven, since we always learn from the mistakes. Clearly, this requires patience (cool mind) so that appropriate measures can be taken to eliminate the previous deficiencies. A medical doctor has to be sensitive to the feelings of the patient he is treating, and a positive attitude here will be very helpful in making the patient follow the instructions and thus achieve positive results in the treatment.

One could imagine from the discussion that even though the two professional subjects are technically very different, qualitatively, the underlying fundamental principles or ***value systems*** in the two are essentially the same: No matter what we do, we require (i) humility (lack of arrogance (ii) honesty (truthfulness) (iii) Integrity (iv) control over greed (v) control over jealousy; healthy competition is always welcome (vi) Contentment (vii) respect for others (viii) desire to work for the benefit of others (ix) forgiveness or kindness, to say the least.

Therefore, along with technical (natural as well social sciences) education, value based education is also required for every individual in the society, no matter what profession he/she belongs to. We term this integrated education as 'Holistic Education'. Values have to be learnt, and more importantly, practiced in daily life. The question arises, what should one do or what policy we should have to impart such an education? The value system has to be imbibed in every student. One simple way to achieve this could be to introduce compulsory courses on 'Ethics in Life' along with the technical courses, at School, College and University levels, the contents of which could be derived from different ancient texts, 'Bhagavad Gita' being one such elegant resource. These had been the core components of education in ancient times, because of which there was greater harmony in the Society. The underlying principle here is, concentrate on self – management and provide the diktats of virtuous living and guidelines for self-management. They highlight the dangers of self-destruction by 'anger', need of self-

control over all the 'Indriyas', benefits of sacrifice of greed, arrogance, and other worldly desires - which are our enemies - and of surrendering at the feet of the divine. The course contents would become more and more extensive as one progresses up the ladder of education.

While teaching is one aspect, practicing in daily life is much easier said than done. How can one ensure that? A possible way to achieve this would be to include in our system of education aspects of philosophy and spirituality – these are again derivable from the Bhagavad Gita - which actually instill firmly the value system in our minds, and one would hesitate to deviate from the set norms of virtuosity. Here, one could include lessons on Yoga and its health benefits as well. Thus, if the value system is practiced by all individuals in the Society, Peace and Harmony will naturally emerge. Holistic Education will also lead to Holistic Research when we seek to carry out research and generate new knowledge, and one drives the other in a dynamic fashion.

Research in social sciences is influenced by parameters such as traditions, natural resources, economic conditions, heterogeneity in the populations, laws of the land (Constitution), language variations and heterogeneities, religious and cultural variations, and parameters of this type. It is also necessary for these researchers to be aware of the research methodologies of natural sciences. They should be able to appreciate the needs, as, mostly, it is these people who are engaged in making policies of the Governments. Thus, a minimal training in these fields is required for social scientists as well.

On the other hand, scientific and technological research can be based on local needs, or it can be globally relevant. In either case it is expected to benefit mankind sooner or later. This can be best understood with certain examples. In a country like India, where Malaria is a common disease, a focus of research will have to be development of vaccines and drugs against this disease. This may not be the case for a European nation. Similarly, in India where Ayurvedic medicines have been in use for thousands of years, but their mechanisms of actions are least understood, a great emphasis can be on developing this knowledge through modern scientific tools. However, researches such as development of novel materials for energy storage, pollution control, novel electronic gadgets, etc, development of drugs against diseases such as cancer are of global interest. All of these are truly interdisciplinary with regard to the fields of natural sciences, engineering, technology and medicine. In all of this research, economic criteria, such as affordability to the common man, cost of manufacturing or isolating from natural resources, quantity parameters have to be borne in mind. Any new research will have intellectual property rights which have to be placed at the right places. This is a subject of law, on one hand, and test of honesty on the other. Thus, training in social sciences must go hand-in-hand to some extent for these professionals as well. The particular choice of social science topics can vary from one scientific field to another.

Curiosity driven researches are generally at the most fundamental or intellectual level, abstract, and their implications would not be immediately apparent or relevant. Gravitation (Newton seems to have asked why does an apple fall *down* from a tree, when he saw it doing so), questions such as why is the sky blue? (this was the genesis of CV Raman's research which led to the discovery of Raman Effect), Einstein's theory of Relativity, theory of energy-mass inter-convertibility, Maxwell-Faraday's laws of electromagnetism, theories and experiments to understand origin of the universe, search for extraterrestrial life, theories of origin of life, questions regarding consciousness, why do birds fly and not humans? are some classic examples. The approaches in such research or their outcomes are unpredictable and would encompass both natural and social sciences, and of course the value system would lie at the heart of this as well, for it to be truthful, reproducible, and, above all, beneficial to the mankind. The atom bomb explosion on Nagasaki and Hiroshima in Japan in 1940s was the devastating application of the energy-mass interconversion discovery. Use of nuclear energy for peaceful purposes such as generation of electricity is useful application of the same.

Thus, put together, a multipronged approach is warranted for research, and we call this, 'Holistic Research'. Policies have to be created by the governments for implementation of such thoughts, which is clearly in the interest of every nation. Holistic education has to start at the school level, continue through the college and university levels, and this can then initiate and promote Holistic Research which would certainly contribute to the development of the nation, on one hand, and create an atmosphere of peace and harmony on the other.