

## NULISTICE Keynote Lecture



# Research, Innovation and Entrepreneurship: How are these Intertwined with Values and Ethics?

Suresh Garg

*Vice-Chancellor, Usha Martin University, Ranchi 835221, India.*

E-mail: [info@ushamartinuniversity.com](mailto:info@ushamartinuniversity.com), [vc.ushamartin@gmail.com](mailto:vc.ushamartin@gmail.com)

**Abstract:** The present day ‘civilized’ society is more materialistic but less happy; more knowledgeable but less wise. We are witnessing all-round erosion in values due to growing greed and consumerism. As a result, mutually conflicting behaviour and self-destroying individualism have put human soul to distress. This *crisis of human spirit* has adversely affected various human endeavors, including tertiary education, research and capacity to innovate. The world is now in dire need of creative and visionary entrepreneurs endowed with social values of life, virtues of humanism and respect for composite culture. It is generally accepted that research, innovation, and entrepreneurship reinforce mutually and whither in isolation. Moreover, these blossom in the fragrance of moral, social and ethical values.

**Keywords:** Research, Innovation, Entrepreneurship, Values and Ethics.

---

## 1. Introduction

Hon’ble Vice Chancellor of the National University of Lesotho, Professor Nqosa Mahao, Chairperson of the Conference Organizing Committee, PVC Prof H. M. Lephoto, Prof. Himanshu Narayan, Honorable dignitaries on and off the dais, distinguished researchers, fellow teachers, Invited Guests, Ladies and Gentlemen,

It is great honour, privilege and pleasure for me to be invited to deliver this keynote address in National University of Lesotho International Science, Technology and Innovation Conference and Expo (NULISTICE 2018). I am grateful to the organizing committee for sparing their kind thoughts for me and facilitating my visit to the kingdom in the sky, though I am aware that they must have had many other options for inviting hard core researchers and technologists.

Friends, I am convinced that sub-themes of this conference are extremely relevant in present day reality. It is well accepted that developments in Science and Technology (S&T) have improved human conditions—physical and biological—as never before. We do not have to reach back very far in history to know that life expectancy in some developing societies was not beyond 30 years. But due to medical advances in the 20th century, the arrow of hope began to point upward even in parts of the world where life clinged

precariously to bones. The emergence of biotechnology and innovative researches in agro-sciences and genetic engineering kindled hopes for alleviation of human hunger. Better farming practices have made it possible to feed more than seven billion souls. It is no exaggeration to say that scientific research has given us the quality of life of our prescription.

We must realize that there is complex interplay between S&T, socio-economic development and sustainability. For instance, ever increasing quest for comfort and over exploitation of natural resources are affecting environment, and we can ignore environmental issues at our own peril. Climate change has now acquired global dimensions, and collective efforts through initiatives such as Paris Convention and UN Climate Change Conference in Doha are needed to counter its ill influences. Time has come to shun the politics of development. Similarly, the developed nations have to be less concerned about local factors as otherwise these could lead to increase in frequency and ferocity of natural disasters such as failing weather patterns, melting of glaciers and hole in the sky.

It is a well known now that pollutants in the environment lead to depletion of ozone layer with consequent increase in UV rays. This is not only causing huge increase in the number of skin cancer cases the world over but also be fatal for agriculture. (In India, this trend is particularly visible in villages situated on hill tops.) Similarly, rising temperatures are

inducing melting of Arctic as well as Antarctic snow leading to increase in sea levels. We are told that geographical boundaries of many countries would modify by the end of 21<sup>st</sup> century as several coastal cities would submerge in water across the globe. In the South Pacific, many island nations are confronting this reality even now. Melting glaciers cause floods, which take away fertile layer of the ground affecting agricultural yields. We have to pool human wisdom to seek answers to questions such as: How can we escape ill effects of climate change caused by environmental degradation? Can futuristic researches in material science, nano-technology and information sciences provide appropriate tools? As an optimist, I am of the firm belief that it is within the realm of possibilities; we can plan to bring helium enriched lunar soil to generate energy in a fusion reactor and turn waste into a resource (generate energy out of waste and convert smog into diamonds) An international conference like this is the ultimate forum for exercising brains.

Ladies and Gentlemen, we are living in an era in which we have same faith in science as our ancestors had in religion. In knowledge era dominated by forces of S&T, fundamental scientific researchers will continue to challenge human intellect. Being a student of physics, it is easier for me to cite some examples from physics. Two most vibrant fields of research in physics as of now are at two extreme ends of the spectrum separated by a gap of the order of 10 raise to the power 23—from nano to cosmological dimensions. The best minds are engaged in devising nano devices, studying Higgs Bosons and detecting gravitational waves. As you would know, discovery of Higgs Boson at CERN's Large Hadron Collider (on 4<sup>th</sup> July 2012) was facilitated by a team of scientists from 26 countries. The financial resources to the tune of eight billion US dollars were pooled by the countries participating in the research project. Similarly, in detection of the four gravitational waves since 2015, scientists from the US and India have pooled intellectual as well as infrastructural resources. This could become possible due to confidence in mutual capabilities and respect for intellect, integrity and honesty of all concerned. The axiom that **Pygmies do not build pyramids** has come true for present day advanced scientific research.

Friends, the title of my talk has three key words: **Research, Innovations, and Entrepreneurship**. I would strive to present how these are intertwined with values and ethics in the knowledge era.

It is said that nature likes simplicity and the most profound things are the simplest. This is also true for affirmative changes achieved through research led innovation and entrepreneurship. In social context, this triumvirate is akin to the combine of monarchy, democracy and pluralism. Just as every morning, daybreak gives us new hopes when we move from

darkness to light and changing seasons bring freshness to life, this triumvirate inspires us to strive for seeking microscopic solutions at societal level for the good of our people.

We know that to provide access to quality higher education, encourage research and promote innovations for development driven changes, it is necessary to create competent and competitive value based **social entrepreneurs** who can serve the society with sense of service. For this, higher education has to be democratized to empower suppressed voices and include latent talent pool. However, it ought to be rooted in national values and cultural ethos. Only then education would transform our society from stagnation and poverty to dynamism and prosperity, from marginalization and deprivation to empowerment and recognition, from ignorance and delusion to enlightenment and liberation and from conflict and intolerance to peaceful co-existence and inclusive growth. For this, existing institutions have to be strengthened and new innovative ones created with capacity to strive for **excellence** in research and values. It essentially implies that what is available is to be upgraded to global benchmarks so that our graduates develop abilities to innovate at par with their peers elsewhere. The developing countries have to put particular emphasis on **quality** and entrepreneurship, which emerge as exceptionally good job creators rather than mere job seekers.

## 2. Research

Research is one of the finest outcomes of human intellect and is fundamental to the intellectual morale of every society. While engaged in a creative and intellectual work, we address questions that actively and continually challenge the discipline's frontiers. We all know that research supports rational debate, unbiased examination of facts and ability to question existing practices and theories in the light of new evidences, i.e. research develops discipline of dissent. And, research is intrinsically coupled with values such as honesty, creativity, innovation, objectivity, truthfulness, foresight, openness and tolerance.

The outcomes of research satiate human curiosity to explore newer horizons and go beyond the known. This has been facilitated by continuous pooling of knowledge ever since a South African cave provided the earliest evidence of fire control by our ancestors some one million years ago. (It is another matter that pace of S&T research accelerated in the last 300 years and overtook social developments of 3000 years.) This undoubtedly proved the most significant milestone in the cultural evolution of human race; it not only provided protection against the elements but also facilitated human geographical dispersion.

It is no exaggeration to say that research is absolutely essential for economic empowerment of any society. Unfortunately, talented students in the developing world have lure for lucre and research is no longer their first priority. To some extent, shifting priorities of federal governments have also contributed to this malaise. To give you an idea of numbers, the differential in the investments in scientific and technological R&D vis-a-vis advanced economies is 1: 250. As a result, 80% – 90% of new knowledge is being created by the rich countries and more than 90% Intellectual Property Rights are owned by them. The point I wish to make is: Third world researchers have not won international recognition for propounding landmark breakthroughs. Such disparities are creating knowledge divide, which does not augur well for us. In this background, I am of the considered view that genuine researchers should be provided liberal support. Moreover, we must guard against the newer reality of crass commercialization of higher education to the extent of denial to the poor and marginalized.

### 3. Innovation

Innovation is successful implementation of creative ideas within an organization or system. From this perspective, creativity of an individual is the starting point for innovation. In general, innovation has been understood variously. According to management Guru Peter Drucker, **innovation is a change that creates a new dimension of performance**. Jose Campos, Founder *Rapid innovation*, considers **innovation as the ability to deliver new value to a customer**. Steven Paul Jobs argued that **innovation differentiated a leader from the laggard**. But conventional understanding about innovation is **commercialization of invention, which refers to new concepts or products that derive from individual's ideas or from scientific research**.

An innovation must be replicable, economic and responsive to a specific need. Innovation involves deliberate application of information, imagination and initiative in deriving greater or different value from resources, and encompasses all processes by which new ideas are generated and converted into useful products. In short, **an action can be identified as innovation if it is new and useful to the system, increases efficiency, is cost-effective, and compatible with or adaptable by other similar systems**.

In business, innovation reduces the gap between expectations of users and performance of products. In social context, innovation refers to devising new collaborative methods such as alliances and partnerships, and in creating buyers' purchasing power. **In education, innovation lies in continuous march towards excellence by involving all stakeholders**

**and devising improvement in various processes to improve learners' progression curve through learner-friendly teaching-learning support from the time a learner registers in a programme till she is certified successful.**

Since teaching-learning is characterized by *transformation and change*, some innovative practices include:

- Creative application of technologies to seamlessly connect with learners to develop domain knowledge and employable skills/competencies;
- Apply innovative pedagogies and media strategies to address learning challenges and situations;
- Make imaginative interventions through best practices;
- Practice ethos of sharing and collaboration to economize on energy, funds and time;
- Develop dynamic assessment tools to continuously measure learner performance in terms of achievement of learning outcomes; and
- Manage knowledge available in public domain for conservation of cultural heritage, values and such other assets.

So in the context of higher education, **innovation implies research based continuous improvement in processes of knowledge creation and its delivery, learner engagement and assessment with due consideration of cultural heritage and societal values**.

We know that now-a-days knowledge is being created very rapidly and in some front-ended fields, the knowledge doubling time is 2-3 years. To keep pace with such developments, it is important to raise commensurate structures. Finland took lead when it merged its top business school, design school and technology school to create value for its people through a multi-disciplinary "University of Innovation". In India also, the Federal Government has created a blueprint to create innovation universities to promote quality of education. Though this idea is being opposed by the purists amongst the intelligentsia, I am of the considered opinion that it should be given serious consideration.

It is interesting to mention here that throughout history, most inventions were inspired by the natural world. But the only 100% *homo sapient* innovation is that of wheel. Evidences indicate that it first made appearance around 3500 BC in Mesopotamia to serve as potter's wheel. But its usage evolved with time; it has been used for irrigation, milling, transportation, games and entertainment. In his efforts to create perpetual motion device, Pascal invented "Roulette", the small wheel and the big wheel "London Eye" is an iconic 'entertainment' landmark on the banks of Thames. In the twentieth century, revolutionary changes in

transportation incubated internationalization have led to multi-cultural societies and global citizens.

It would not be out of place to mention here that innovation should not be confused with creativity, which is confluence of knowledge, out of box thinking and hard work. However, application of a creative idea and its realization in action is innovation. That is, **innovation is a new way of doing something which leads to changes in thinking, products, processes or an organization.**

#### 4. Entrepreneurship

The concept of entrepreneurship is believed to have been coined around 1700's and since then, it has been defined in many ways. According to Schumpeter, entrepreneurship is the carrying out of combinations of a new product, a new method of production, opening a new market and carrying out a new organisation of industry. Peter Drucker considered entrepreneurship as a practice, which embodies risk taking, innovation and venturing into new business activities for profit. The National Knowledge Commission appointed by the Indian Prime Minister in 2006 defined entrepreneurship as professional application of knowledge, skills and competencies and/or monetizing a new idea by an individual or a group of individuals by launching a new enterprise de novo. That is, to pursue growth while generating wealth, employment and social good.

An entrepreneur has capability to identify unnoticed opportunities in ambiguous situations, harness resources to convert the opportunity into a venture and possesses skill to make creative pathways. That is to say, an innovative entrepreneur has vision and dreams, achievement motivation, clarity of thought and strength to survive. Above all, she has ability to take risk and willingness to invest her intellect, effort and money. She strongly believes in the axiom one designs and many built. Narayan Murty, Steven Jobs, Bill Gates, Travis Kalanick and Mark Zuckerberg are some familiar entrepreneurs of the past fifty years.

Entrepreneurship involves disruptive innovation or creative destruction wherein a new revolutionary idea leads to downfall of existing practices, norms, industries or people. Introduction of Uber and Oyo provided cost-effective and reliable alternatives to commute and boarding. In fact, these are very good examples of disruptive innovation. Similarly, introduction of personal computers and mobile phones, which led to downfall of mainframe computer companies and landline phone companies, respectively, are also great examples of creative destruction.

In education, visionary entrepreneurs increased access to quality education through public and private initiatives by establishing institutions such as

Cambridge, Harvard, Stanford, Wharton, Yale, Cal Tech, Oxford, NUS, Cambridge, etc. We all know the premium attached with these institutions. Similarly, William Rainley Harper, Sir Issac Pitman, John Wilkinson Taylor, George Siemens, Otto Peters, Asa Briggs, Walter Perry have been pioneers of open and distance learning were first rate educational entrepreneurs who continued to march ahead against all criticism and ultimately succeeded in providing a reliable complementary mode to learn in a very rich environment created using information and communication technologies. More recent disruptive innovations in higher education are the MOOCs and mainstreaming of Open Education Resources (OERs). Despite such affirmative developments in knowledge creation and dissemination, the society is witnessing all-round erosion of values due to growing greed and quest for comfort. There is dire need of creative entrepreneurs, who in their earlier incarnation worked as social reformers like Swami Vivekananda and Martin Luther King Jr, with a vision encompassing value-orientation of society and empowering the youth to inculcate values of life and virtues of humanism for harmonious living in composite culture.

#### 5. Ethics and Values

Ethics is a concern for others—all living beings in nature. Ethics covers rules of righteous conduct and behaviour. That is to say, an individual should be ethical in thought, word, action, transaction and relationships towards fellow beings, in business/profession and to other life-forms. Ethics applied to family means that partners are mutually respecting, accommodating and sympathetic. A religion is ethical in its relationship with other religions through observance of values such as tolerance, non-interference and peaceful co-existence.

Ethics are powerful determinants of moral, religious, spiritual, social and professional conduct. These provide sound foundations to a civil society and call for adherence to judgements grounded in values of life. At the social plane, aspects such as equity, human dignity, gender equality, social justice, liberty and freedom, privacy and confidentiality constitute ethics. In medical science, professional ethics became recognized in the form of Hippocratic Oath as early as 400 BC. However, in fields such as management and business, science and technology, professional ethics are of recent origin. The bio-agro-nano-info driven debates have serious implications for ethical values in scientific research. It is therefore, both necessary and desirable for every society and institution to create awareness about and guard against unethical practices.

In the context of education, observance of ethics has implications for all stakeholders associated with

delivery of education. Observance of ethical values on the part of an organization demands that it provides value for money and time. It must therefore,

- Observe core values such as transparency, accountability and learner-sensitivity;
- Act democratically where decisions are taken through wider consultations and everyone associated with it nurtures ownership feeling;
- Cherish academic freedom and continuously work towards excellence;
- Fulfill its core function of developing learners as responsible citizens with required values; and
- Practice time-tested strategies for financial management and accountability to all its stakeholders.

Values are attributes which we as individuals and collectively as society consider important. While truth, honesty, integrity, love, compassion, and peace are universal values, beauty and goodness are supreme intrinsic values of life. Pursuit of non-violence for achievement of peace is an instrumental value. Perfection and thoroughness in task/job/profession are technical values. Pursuit of peace may imply pursuit of several inter-related values like self-discipline, tolerance, unity, harmony, friendship, faithfulness, sincerity, etc.

Gratitude, indebtedness and Ahimsa are vital cultural values. We feel grateful to our parents for our upbringing and character building; obliged to our teachers for providing knowledge and skills; and to Mother Nature for various gifts, which make life comfortable and enjoyable. Our educational programmes and activities will do well to espouse and foster these values to create responsible, discerning and law abiding citizens, who can control themselves in trying moments.

In present times, wisdom and knowledge are not in equilibrium and there is growing dehumanization of soul. The present day civil society is materialistically rich but less happy; more knowledgeable but less wise and low on humanity. In fact, mutually conflicting behaviour and self-destroying individualism have put human soul to distress. For this crisis of human spirit, we cannot be proud of the moral standards of digital natives. Some people tend to view these developments as a sign of evolution of society but I am of the considered view that such undesirable trends are a result of erosion of values. And to find a way out of the chaos, we need the wisdom of the likes of Mahatma and Madiba and inculcate social values, strive for

morality in action and shed greed, hatred, conflict and violence.

## 6. Research, Innovation and Values

As such there are no facile formulae for innovative research but philosophy of Anekantvad, which is central to Jainism, highlights respect for the views of 'many'. Values such as clarity of thought, openness, objectivity, and determination to achieve the goal, foresightedness, conviction and truthfulness to purpose are integral to research and pave way for pursuing unconventional paths and for innovations. Moreover, the value system of a researcher is very vital for sustenance of innovations.

## 7. Innovation, Entrepreneurship and Values

We now know that the goal of innovation is to usher positive change like cutting cost, improving quality and maximize productivity. For fostering innovation, an entrepreneur implements his ideas initially at microscopic scale. And to be successful, he has to be ethical with his business partners and honest in transactions with individuals as well as the state. It is another matter that entrepreneurship in some emerging economies is envied the world over for their persistence rather than their ingenuity.

## 8. Conclusions

I would like to say towards the end of my talk that innovation and entrepreneurship have two way relationships and it would only bloom in the nurturing culture of ethics and values. The innovator germinates and an entrepreneur implements the idea. The entrepreneurial culture drives creation of wealth from knowledge, creates jobs and paves way for further innovation.

I conclude by observing that if we have to leave our imprint on the 'sand of time', we have to continuously innovate and overcome tendency for maximization of material wealth. There is now a need to know the mind, to shape the mind and to liberate the mind from greed and self-centeredness more than ever before. We have to integrate knowledge with wisdom while innovating with entrepreneurial spirit for the welfare of society.

---

The author Professor Suresh Garg is currently the Vice-Chancellor of Usha Martin University, Ranchi, India. Prior to taking this assignment, he had served as Pro-Vice-Chancellor and Professor of Physics at Indira Gandhi National Open University (IGNOU), New Delhi. He was at NUL for two years during 2008 – 2010 as Founding Director, Centre for Teaching and Learning (CTL) on secondment of the Commonwealth Secretariat, London. He can be contacted at: [vc.ushamartin@gmail.com](mailto:vc.ushamartin@gmail.com)