

Details of Module and its structure

Module Detail	
Subject Name	Education
Paper Name	Perspectives, Issues and Research in Teacher Education
Module Name/Title	Researching Pioneer Competencies in India
Module Id	e-PGEDN 10.25
Pre-requisites	
Objectives	<p>After going through this topic the learners will be able to</p> <ul style="list-style-type: none"> • identify pioneer and pioneer competencies • explain attributes of Nobel Laureates. • recall Nobel Laureates of India • appreciate the problems addressed by the Pioneers
Keywords	Pioneer, Nobel Laureates, Competencies

Development Team

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1. Introduction

One might use the two terms researcher and pioneer interchangeably but the two terms are quite different from each other. Let us first try to understand the fact that who is a researcher and who is a pioneer. A researcher is one who is fully lost in quest of solutions to the problems constantly through humanistic and scientific approach irrespective of the discomfort. A pioneer is noblest number one innovator who identifies with the universe holistically. A pioneer germinates, incubates, innovates, creates and constructs. A pioneer is around the clock lost in sensing, formulating and addressing developmental challenges through most innovative, creative, constructive and connectionist approaches. In the next section you will be elaborately explained the meaning of term “Pioneer.

2. Meaning of Pioneer

The universe has revelations in many varied forms. There is no space, no spot, no dot in the universe which is problem independent, even, vacuum is in problem. How to justify the existence of every entity, their interconnection and occurrence of various phenomena? The question is that of identification with the universe. But, in this plight of identification, no thesis, howsoever, comprehensive and precise is ultimate. We are degrees of a domain and discipline. No one is hundred percent perfect in internalizing the universe. The question is how big and substantive is our knowledge base? With the efforts of all the generations we still have a very little knowledge base of the universe. It is because identification with the universe demands around the clock quest, systemic, holistic, systematic research with full dedication independent of all the noises, and with capacity of understanding and connecting the interplay of many varied variables.

The pioneers in various disciplines have very well demonstrated the identification. But, where do we stand in understanding the reality we are with. The reality is independent of all of us who try to investigate it. Then how a subjective investigator can have objective view of the reality? It demands infinite, rather, indeterminate arrays of abilities, capabilities, skills and competencies to reach the reality. There are various challenges and conditions which are limiting the quest. Scientific realism is too meek to capture the reality. But, there have been

sages, wandering ascetics, spiritual scientists along with physical scientists to provide and activate the strength and power of soul within and between us. It is true that there is only one cause and all the rest are effects. So, it is impossible by the effects to have intelligibility of the cause comprehensively. But the pioneering and innovative research in the form of constructions and connections, though very limited, is quite enlightening.

3. Understanding Pioneer Competencies

Pioneer is a quintessential recluse, that is, unique excellent innovator, who tends to be close to the creator on the object of quest. Germination, Incubation, Innovation, Creation, Construction and connection are the essential attributes of a pioneer, who is lost in the quest around the clock, with positive attitude despite all discomforts.

The marvelous mysteries and deep secrets of the nature are revealed when a Researcher is fully lost in the quest. It is in tune with Swami Vivekananda vision and determination that “arise, awake and stop not till the goal is reached”. The ultimate goal is a perfect becoming with skill, scale and speed, constructivist, connectionist and naturalist, proud of thy creation, always humble, a holistic being, an embodiment of the soul, having perfect entrainment of heart, brain, senses, motor- muscles, resonating self with the environ, a universal being with unconditional eternal love and affection for all, mostly roaring, a blissful being, transcending time, space and mind to be one with the sole Soul. A pioneer is a curious, determined, dedicated, committed, eternal scholar with a unique profile. Nobel laureates may not be roaring IQ, but they are highly goal oriented dedicated people who fully strive for finding the truth and reality.

4. Some Nobel Laureates of India

How to research the pioneer competencies is beyond the conceptual framework, theoretical framework, propositions, methodology, tools and techniques of the investigators with limited knowledge base. So in order to get a better understanding of the pioneer competencies of Nobel Prize laureates let us examine some of them one by one:

A. Rabindranath Tagore

Rabindranath Tagore, India's popular poet and writer was awarded Nobel Prize for Literature in the year 1913 for "Geetanjali" which was basically a collection of his poems. You will be surprised to know that his compositions were selected as national anthem by two nations i.e. India (Jana Gana Mana) and



Bangladesh (Amar Shonar Bangla). As an advocate of the Bengal Renaissance, he advanced a vast canon that comprised paintings, sketches and doodles, hundreds of texts, and some two thousand songs. His legacy endures also in Visva -Bharati University - the institution he founded. Tagore modernized Bengali art by spurning rigid classical forms and resisting linguistic strictures. His novels, stories, songs, dance-dramas, and essays spoke about topics that were political and personal. His verse, short stories, and novels were highly praised for their lyricism, colloquialism, naturalism, and unnatural contemplation. Some sources even state that the national anthem of Sri Lanka was also written by Tagore while some others state it was inspired by his work.

B. Chandrasekhara Venkata Raman (C.V. Raman)

Chandrasekhara Venkata Raman was an Indian Scientist. In 1922 he published his work on the "Molecular Diffraction of Light", the first of a series of investigations with his collaborators which ultimately led to his discovery, on the 28th of February, 1928, of the radiation effect which bears his name ("A new radiation", Indian J. Phys., 2 (1928) 387-398). You will be amazed to know that within a short span of two years



and five months, 385 papers and five special monographs were published by him. The Nobel Committee was of the opinion that Raman established the universal character of the effect by investigating a large number of solids and liquids. This helped him to get Nobel Prize in Physics. He was awarded Nobel Prize of Physics in 1930 for his "Raman Effect" related to light. Discovery of the effect was hailed by an American physicist R.W. Wood (1868–1955) as '...one of the best convincing proofs of the quantum theory'. He received the Nobel Prize

in a record time of two year after the discovery. Due to the simplicity of the apparatus, the application of the discovery in the field of experimental and theoretical physics grew rapidly. Other investigations carried out by Raman were: his experimental and theoretical studies on the diffraction of light by acoustic waves of ultrasonic and hypersonic frequencies (published during the year 1934-1942), and those on the effects produced by X-rays on infrared vibrations in crystals exposed to ordinary light. In 1948, Raman through studying the spectroscopic behavior of crystals, approached in a new manner fundamental problems of crystal dynamics. His laboratory has been dealing with the structure and properties of diamond, the structure and optical behavior of numerous iridescent substances (labradorite, agate, opal, and pearls). His other areas of interests were the optics of colloids, electrical and magnetic anisotropy, and the physiology of human vision.

C. Har Gobind Khorana

Har Gobind Khorana also known as Hargobind Khorana was born on January 9, 1922 and died on November 9, 2011. He was an Indian-American biochemist. He was India's doctorate in chemistry. He was awarded Nobel Prize for medicine in 1968 for his study of the Human genetic code and its role in protein synthesis. There is one interesting incident about Dr. Har Gobind



Khorana. As per this incident he simply showed up in the laboratory of Dr. Vladimir Prelog in Zurich, with no recommendations, and pleaded for a little space to do postdoctoral research under him. On the top of this his determination and tenacity to learn the German language well introduced him to the world of a class of chemical reagents called 'carbodiimides', which proved pivotal for much of his early work on the synthesis of nucleotides, nucleotide coenzymes and the first synthesis of a gene, and he ended up in Vancouver, Canada for his first position as an independent investigator.

He shared the 1968 Nobel Prize for Physiology or Medicine with Marshall W. Nirenberg and Robert W. Holley for research that helped to show how the order of nucleotides in nucleic acids, which carry the genetic code of the cell, control the cell's synthesis of proteins.

Khorana and Nirenberg were also awarded the Louisa Gross Horwitz Prize from Columbia University in the same year. Khorana was the first scientist to chemically synthesize oligonucleotides.

D. Mother Teresa

Mother Teresa, a Yugoslavian nun who became an Indian citizen was awarded Nobel Prize for peace in 1979 for her service through her charitable mission “Nirmal Hriday” at Calcutta to people suffering from leprosy and to those dying as destitute.



When she was young, Mother Teresa learned that “the absence of material things did not necessarily impair the capacity for happiness” (Spink, K, 1997). What are your thoughts about this? How is Mother Teresa’s outlook on possessions different from the outlook displayed by many people today?

Mother Teresa had first been recognized by the Indian government much earlier when she was awarded the Padma Shri in 1962 and the Jawaharlal Nehru Award for International Understanding in 1969. She continued to receive major Indian awards in subsequent years, including India’s highest civilian award, the Bharat Ratna, in 1980. Her official biography was written by an Indian civil servant, Navin Chawla, and published in 1992.

Mother Teresa had been bestowed many awards, topped by the Nobel Peace Prize in 1979. Other awards included doctorates honoris causa by many universities, and large cash prizes. She never considered any of these prizes and cash awards as personal property, but merely accepted them in the name of the poor--and spent every cent on them.

On 28 August 2010, to commemorate the 100th anniversary of her birth, the government of India issued a special five-rupee coin which was the sum she first arrived in India with. Previous President of India Smt. Pratibha Patil appreciated the role of Mother Teresa in

following words: “Clad in a white sari with a blue border, she and the sisters of Missionaries of Charity became a symbol of hope to many – the aged, the destitute, the unemployed, the diseased, the terminally ill, and those abandoned by their families”.



E. Subramanian Chandrasekhar

Dr. Subramanian Chandrasekhar, an Indian Astro-Physicist was awarded Nobel Prize for Physics in 1983 for his theory on white dwarf stars’ limitation known as ‘Chandrasekhar Limit’. In recognition of his well-known work on the internal operation and life cycle of stars such as the sun, and for his development of the new radiation heat transfer and fluid flow analysis techniques Dr. Chandrasekhar was indeed chosen as the Abbot Award recipient for 1991. Dr. Chandrasekhar was especially pleased to be chosen as Abbot Award recipient because the solar measurements of Abbot had been critical in the work done, many years earlier, in determining the composition of the sun. This in turn had made it possible to determine how the sun produced solar energy.

He wrote that his scientific research was motivated by his desire to participate in the progress of different subjects in science to the best of his ability, and that the prime motive underlying his work was systematization. “What a scientist tries to do essentially is to select a certain domain, a certain aspect, or a certain detail, and see if that takes its appropriate place in a general scheme which has form and coherence; and, if not, to seek further information which would help him to do that.” Chandrasekhar developed a unique style of mastering several fields of physics and astrophysics; consequently, his working life can be divided into distinct periods. He would exhaustively study a specific area, publish several papers in it and then write a book summarizing the major concepts in the field. He would then move on to another field for the next decade and repeat the pattern. Thus he studied stellar structure, including the theory of white dwarfs, during the years 1929 to 1939, and subsequently focused on stellar dynamics from the year 1939 to 1943. Next, he concentrated on the theory of radiative transfer and the quantum theory of the negative ion of hydrogen from the year 1943 to 1950. This was followed by sustained work on hydrodynamic and hydro magnetic stability from the

year 1950 to 1961. In the 1960s, he studied the equilibrium and the stability of ellipsoidal figures of equilibrium, and also general relativity. During the period, 1971 to 1983 he studied the mathematical theory of black holes, and, finally, during the late 80s, he worked on the theory of colliding gravitational waves.



F. Amartya Sen

Dr. Amartya Sen, an Indian Professor in Economics was awarded Nobel Prize for Economics in 1998 for his work in Economic Theory related to Poverty, Democracy, Development and Social Welfare. With his Nobel Prize award money, Amartya Sen set up the Pratichi Trust which carries out research, advocacy and experimental projects in basic education, primary health care and women's development in West Bengal and Bangladesh. Professor Sen himself took active interest in this work—helping set the agenda, looking at the evidence from research, and engaging in advocacy. Sen's significant findings and insightful observations and recommendations have relevance much beyond West Bengal.



G. Venkatraman Ramkrishnan

In the year 2009, Venkataraman Ramakrishnan, an Indo-American shared Nobel Prize for Chemistry along with a co-American Thomas Steitz and Ada Yonath of Israel for mapping ribosomes, the protein producing factories within cells at the atomic level.

Ramakrishnan was born in Chidambaram in Cuddalore district of Tamil Nadu in India. He was born to C. V. Ramakrishnan and Rajalakshmi. Both his parents were scientists and taught biochemistry at the Maharaja Sayajirao University in Baroda. He moved to Baroda in Gujarat at the age of three, where he had his schooling except for spending the period from the 1960 to 1961 in Adelaide, Australia. Following his Pre-Science at the Maharaja Sayajirao University of Baroda, he did his undergraduate studies in the same university on a National Science Talent Scholarship, graduating with a B.Sc. Degree in Physics in 1971.

In a lecture in January 2010 at the Indian Institute of Science, he revealed that he failed to get admitted to any of the Indian Institutes of Technology or the Christian Medical College, Vellore, Tamil Nadu.

Immediately after graduation he moved to United States of America, where he obtained his PhD degree in physics from Ohio University in 1976. He then spent two years studying biology as a graduate student at the University of California, San Diego while making a transition from theoretical physics to biology.

Ramakrishnan began work on ribosomes as a postdoctoral fellow with Peter Moore at Yale University. After his post-doctoral fellowship, he initially could not get a faculty position even though he had applied to about 50 universities in the United States of America.

He continued to work on ribosomes from 1983 to 1995 as a staff scientist at Brookhaven National Laboratory. In 1995 he moved to the University of Utah as a Professor of Biochemistry, and in 1999, he moved to his current position at the Medical Research Council Laboratory of Molecular Biology in Cambridge, England, where he had also been a sabbatical visitor during 1991-1992.

In 1999, Ramakrishnan's laboratory published a 5.5 Angstrom resolution structure of the 30S subunit. The following year, his laboratory determined the complete molecular structure of the 30S subunit of the ribosome and its complexes with several antibiotics. This was followed by studies that provided structural insights into the mechanism that ensures the fidelity of protein biosynthesis. More recently, his laboratory has determined the atomic structure of the whole ribosome in complex with its tRNA and mRNA ligands. Ramakrishnan is also known for his past work on histone and chromatin structure.

H. Kailash Satyarthi

In the year 2014 educational rights campaigner Kailash Satyarthi shared Nobel Peace Award with Ms. Malala Yousafzai. Kailash Satyarthi was born in 1954 in Vidisha district of Madhya Pradesh, India. He has a degree in electrical engineering and a post-graduate diploma in high-voltage engineering. Kailash Satyarthi had maintained the tradition of Mahatma Gandhi and headed various forms of peaceful protests, “focusing on the grave exploitation of children for financial gains”.

The life and work of Mr. Kailash Satyarthi is synonymous to the never-ending crusade against child slavery. While teaching as a professor in a college in Bhopal, Mr. Satyarthi decided to work more actively for social change. Along with a set of friends, he founded Bachpan Bachao Andolan (BBA) in 1980. BBA (Save the Childhood Movement in English) symbolizes the struggle against child labour and child servitude. The organization is also the initiator of the first regional South Asian people’s movement, the South Asian Coalition on Child Servitude (SACCS), a conglomeration of more than 750 civil society organizations. As per available figures till October 2014 BBA team had led to the rescue and withdrawal of more than 83,000 child bonded labourers and developed a successful model for their education and rehabilitation.

In 1998, Mr. Satyarthi organized the Global March against Child Labour (GMACL) across 103 countries with participation of over 7.2 million people and 20,000 civil society organizations. It is the largest peoples’ campaign on child labour that led to ILO Convention 182 on the worst forms of child labour. It has been successful in the formation of the Global Task Force on Child Labour and Education, which is a working committee of UN agencies and GMACL for policy coherence and concerted action on child labour elimination, education for all and poverty alleviation.

The education initiative led by Mr. Satyarthi is the coalition of civil society networks, foundations and teachers association campaigning for the implementation of Dakar goals of ‘Education for All (EFA)’ through international advocacy and lobbying work.



As an analytical thinker, Mr. Satyarthi has been the pioneer advocate of the now established ‘Triangular paradigm of development’ interlinking child labour elimination and poverty eradication with education for all. He is combating the use of child labour by creating domestic and international consumer resistance to products made by children in bonded labour. In 1994, he started “Rugmark”, a social labeling programme in which rugs are labeled and certified to be child-labour-free by factories that agree to be regularly inspected.

He has promoted the empowerment of children through the formation of Bal Mitra Grams (Child Friendly Villages). The concept of ‘Bal Mitra Gram’ is an innovative approach towards total elimination of child labour and universalization of education. Children’s village council has evolved to enhance community awareness and participatory democracy and has been an unprecedented success.

Mr. Satyarthi, at age 60, is closer to the average age of Nobel laureates, having spent decades building a global campaign for children’ rights, initiated in India in 1980 in the fight against child labour.

What makes Mr. Satyarthi different from others is that up till now only a small number of scholars were found to be going deep into security studies. There was inattention to and somewhat paradoxically deep entanglement with children and childhood. The Nobel Committee’s historic elevation of children’s security issues in its recognition of Mr. Satyarthi and Ms. Yousafzai and is simultaneously an encouraging development and revealing of weightier questions.

5. Problems Addressed by the Pioneers

There are many developmental challenges of India, such as , assimilating the globalization, managing knowledge, continuous updating of knowledge and skills, creating new age institutions, balancing materialism and values, use of resources, working with multiple languages and multiple cultures, meeting the climatic and environmental challenges,

sustaining development, collaborative living, holistic development, developing vocational skills, enhancing communication skills, quality control, removing public private dichotomy, controlling rising materialistic values, realizing even distribution, controlling ecological imbalances, fair recognition, valid accreditation, sustaining symbiosis, respecting cultural heritage, sustaining sensitivity to the basic values, convergence of state, society, education and judiciary, respecting rights of all, and transcending time, space and mind. There is infinite universe and beyond yet to be explored. India which has had the grace of being contented, peaceful, healthy, happy, beautiful, cultured society is moment by moment losing its natural bliss and beauty. We have become insensitive to our Indian heritage of peaceful struggle. Each one of us needs to recreate, revive and refresh ourselves holistically to value our heritage and build a strong, powerful, cultured, dedicated, gracious and pioneer India.

From this discussion we can conclude that some of the attributes of Nobel laureates of India are:

- They have a passion and dedication.
- They believe in simple living and high thinking.
- They fully identify with the objects of their quest.
- All of them are universal becoming.
- They are intensely connectionists.
- They have a wonderful sensitivity and skill of scanning.
- They try their levels best to transcend time-space-mind and self.
- They are fully lost in the realization of their goal, regulating, both, the in-vivo and external.
- They rarely aspire for awards and rewards.
- Their acts and texts have own testimony.
- They realize quality and perfection with every bit of action.
- They live alone in and with the crowd.
- They are goal oriented around the clock.
- They try to set all the systemic parameters with them in perfect resonance.
- Irrespective of the disciplines they are identified with, they are ultimately Spiritual

Scientists.

6. Developing Pioneer Culture

Developmental challenges demand pioneers with interdisciplinary competencies. How long will we compromise with the fragmented research? Should it not be holistic? Why the Scientists have not come out of the laboratories? Is not there a need to conduct naturalistic situational research through deep observation, reflection and intuition and construct grass root theories, addressing our problems, through our tools, through our sources and resources, to better our quality of life and living?

Indian brain is highly evolved. Indian artists, scientists, scholars, technocrats, researchers, and industrialists, as well as businessmen all are quality service oriented in their core. There are pioneers and pioneers in India. But, we are more used to the foreign molecules in most of the domains whereas the India molecules wait for years together to be patented. We have more craze for the extraneous at the cost of indigenous. Our apex institutions are mad after the foreign products.

There should be healthy relationship between the State, Society, Judiciary and Education. We should learn to love the indigenous. We should learn to manage with the minimum essential. The creativity of the budding scholars ought to be incubated in the Indian schools. There should be capable teachers and congenial culture to facilitate the innovations. There should be research culture in Indian institutions. How long we will go on duplicating, replicating and stereotyping? We ought to learn to value the indigenous. Facilities should be created at national level for providing clinical trial. The institutions should fund patenting. Facilities should be provided for patenting and scale production of the valuable products and their marketing. Scientists should move from the laboratories to the operational level. There should be university industry interface for developing research culture and ambience. National meet of researchers in various disciplines should be the integral feature of Indian Higher Education. We should learn how to showcase and deploy to the operational level. Indian Scholars and Scientists should earn respect. What are we busy with, if we don't create even

the minimal facilities to live in India that we Scientists have to seek shelter abroad? Most of our institutions are busy imitating and duplicating. There is rare expression and appreciation of the innovative.

Originality and creativity demand peaceful and healthy ambience. Unless we Indians learn to respect the indigenous, and develop a compatible culture we will fail to have noble laureates. There is a lot of awakening amongst Indian pioneers and we should not let their efforts go waste. It is high time that we learn to appreciate the passion and around the clock dedication of these pioneers.

It is really surprising to learn someone else telling our problems. Let us learn to identify and identify with our problems and address these indigenously. We need to be smart scientific humanistic cheerful players. Let us exercise and realize our potentials. India will have to revive its cultural heritage and modernize socially, logically, scientifically, technically and transcend space, time and mind to realize its status. For that let us learn to activate and respect the *self*.

7. Conclusion

Basically the intent of the present module was on mapping the competencies of the pioneers and trying to emulate these to address numerous problems so as to recreate and reform this sphere as a happy, healthy, peaceful abode for all. The focus was on recalling Nobel Laureates of India and researching pioneer competencies in India.

There is no parallel to Indian heritage, ethos, values and culture. Let us search and re-search and find our own selves and basic culture through our pioneering striving. Where are we lost? We ought to find our own selves.