Rs. 30.00
ISSN 0566-2257

UNIVERSITY NEWS

A Weekly Journal of Higher Education

Association of Indian Universities
Vol. 58 • No. 42 • October 19-25, 2020

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UNIVERSITY NEWS
Vol. 58 October-19-25
No. 42 2020
Price Rs. 30.00

A Weekly Journal of Higher Education Published by the Association of Indian Universities

In This Issue

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(Effective April 01, 2020)

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Scientific Methods in Research and Sir Francis Bacon: Contemporary Relevance# Part -1

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All inductive sciences dealing with nature and the human world are linked together by a common thread from the point of view of mode of investigation. This linking thread is formed by the scientific method. The scientific method is not to be confused with the use of scientific gadgets and techniques whose number has now grown into a legion. Rather it refers to a generalized process of acquiring reliable knowledge about the world around us. A whole body of literature under the label philosophy of science has appeared in print about its various aspects–how it differs from other modes of investigation such as religious revelations, psychic pronouncements and poetic compositions; its development across centuries; roles of inductive and deductive forms of reasoning; nature of explanation and its types; and place of law-like formulations.

In the larger sense, scientific knowledge is an extension of common sense; indeed, the great nineteenth-century scientist Thomas Henry Huxley called it systematized common sense. Science has certain definite attributes which distinguish it from other modes of information. These include inter subjectivity, testability, comprehensiveness, and precision achieved by the employment of a specific body of concepts and measuring procedures and devices. Most important of all, unlike religious enunciations which claim finality, science is self-corrective and makes a provision for revisions, thereby rendering knowledge acquisition a dynamic process.

Various definitions of the scientific method are available. Johnson, a geologist by profession, defines it as "any method which effectively utilizes the several powers of the mind in a systematic, impersonal, non-emotional, unprejudiced effort to discover the origin and relationships of the phenomena, and the laws which control their manifestation" (Johnson 1975: 156).Carl Hempel, a philosopher of science, calls it inquiry which examines "how knowledge is arrived at, how it is supported and how it changes" (Hempel 1966: 2). John Dewey, also a philosopher and educationist, calls it inquiry and says that it originates in doubt and terminates when warranted assertions for its removal are arrived at (Dewey 1938). Doubts about the empirical world involve questions not only of what, when and where but of why and how as well. The scientific method seeks to answer these questions. Three general sequential stages are recognized in the application of the scientific method in empirical sciences: initiation of inquiry; natural

 # The Article is in 2 Parts. Second Part will be Published forthcoming issues of University News.

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history (inductive) stage; and hypothesis formulation and testing. Writers from Aristotle to Einstein have recognized that the scientific method involves an unending cycle between facts and ideas.

In general discussions about the scientific method, the British philosopher Sir Francis Bacon's (1561-1626) name does come up frequently. He is commonly referred to as the chief protagonist of inductive methodology and the matter is mostly left at that level. There is now a resurgence of interest in Bacon's thought and a comprehensive project called "Oxford Francis Bacon" intitiated by Graham Rees in the 1990s is in progress for reassessing his contributions. Indeed there is more to his work than meets the eye and in this article I intend to highlight the relevance of his ideas to the contemporary world of learning in particular and society in general. It will be useful to start with a brief historical account of the scientific method (Losee 1977).

Historical Perspective

Aristotle was the first person to comment on the method of inquiry which in the ancient period was treated as part of natural philosophy. He valued knowledge for its own sake and equated it with understanding materials and events as they are through experience gained by using our senses. His inductive–deductive method commences when observations are initiated about events and materials and from these observations certain explanatory principles are induced. It is these principles which form the source for a discipline's set of deductive or syllogistic statements; these have a sort of finality associated with them and hence regarded as necessary truths. Aristotle's method held its sway throughout the medieval period and his writings were compiled to form a guide-book called the *Organon*.

Modern period commenced with a new scientific fervour about the phenomenal world, as facilitated by Copernicus' announcement of heliocentric theory and Kepler's formulation of laws governing planetary motions. Through his telescopic observations Galileo extended support to Copernicus' heliocentric formulation and thus introduced the method of experimental proof for testing scientific conclusions. As we shall soon note, Francis Bacon replaced Aristotle's dialectic and syllogistic method with his inductive method. While Bacon advocated progressive ascent from particulars to general principles, Descartes' deductive methods ought to begin with the most general principles at the apex and proceed downwards to the lowest level.

The 17th and 18th centuries witnessed further developments. Newton reformulated Aristotle's inductive-deductive method and its elaboration by Francis Bacon and Galileo as the method of analysis and synthesis. It insisted on experimental confirmation of the consequences deduced by synthesis and also emphasized the value of deducing consequences that go beyond the original inductive evidence. Newton's name is often associated with the statement "Hypotheses non fingo", meaning "I feign no hypotheses". This has been interpreted by some writers to mean that Newton was against the use of hypotheses. He made this comment while referring to various theories put forward by workers about the underlying cause of gravitation. Actually speaking, he himself toyed with the notion of an ethereal medium being the governing force of gravitation. He further conceded that hypotheses could direct future work and also he provided a place for scientific generalizations (Blake 1960: 124-35).

We then have the formulations of two British thinkers–John Locke and David Hume – and two German writers – Gottfried Leibniz and Immanuel Kant. Locke held that science's goal was one of arriving at a set of probable generalizations about phenomena and their associations and sequences and that these do not satisfy the rationalists' ideas of necessary truths. While holding sense impressions as the sole source of knowledge of matters of fact, Hume did provide a role for the mind to arrive at empirically significant concepts by "compounding, transposing, augmenting, or diminishing" of ideas derived from sense impressions. But he clarified that even with the availability of these empirical concepts no necessary truths could be taken for granted. Hume's ideas of causation too were tuned to the probabilistic nature of knowledge.

Leibniz attached a higher degree of probability to empirical generalizations about "nominal essences" of the phenomenal world because these are derived from metaphysical principles or monads formed about its "real essences". Kant conceded with Hume that sense experiences form the basic source of our knowledge of external world but accorded a more prominent and agentive role to the mind or the knowing subject, which takes up the job of structural-relational organization of raw material accumulated through sense impressions. He specified three

stages in the organization of sense impressions into a coherent body of knowledge: a) the unstructured sense impressions are ordered with respect to Space and Time ("Forms of the Sensibility" or perceptions); b) such perceptions are related to what he calls "categories of understanding" or concepts such as Unity, Substantiality, Causality, and Contingency; and 3) organization of "judgements of experience" into a unified body of knowledge through application of "Regulative Principles of Reason". Kant believed that the regulative principles of reasondo prescribe ways of constructing scientific theories. He cited predictive power and testability as criteria of acceptability of scientific theories.

In the 19th century conceptions about the scientific method became more specific and elaborate and formed an important component of philosophy of science. John Herschel stated that laws of nature used for building scientific theories refer to correlations of properties or sequences of events and that these could be achieved either through specification of inductive schema or by the formulation of hypotheses. William Whewell was both a historian and a philosopher of science, as exemplified in his two outstanding works titled *History of the Inductive sciences*(1837) and *The Philosophy of the Inductive Sciences* (1840). He visualized scientific progress as a series of steps involving a successful union of facts and ideas. Whewell clarified that induction was not a mere compilation of facts but involved colligation where binding together of facts takes place under a conceptual framework. Scientific progress involved successive incorporation of lower level generalizations into higher level generalizations and the latter into theories.

John Stuart Mill's *System of Logic* continued the inductive tradition of previous periods but surely transformed it into a more elaborate procedure. He prescribed four methods for discovery of scientific laws – method of agreement, method of difference, method of concomitant variation and method of residences. Like Whewell, he provided a place for inventive ideas or hypotheses in scientific research but insisted that a true verification of a hypothesis entails the exclusion of all possible alternative hypotheses. W.S. Jevons treated induction and deduction as complementary to each other where the former is the *inverse* of the latter. Charles Sanders Peirce reframed the method of hypothesis and called it abduction.

As a sort of counterbalance to this growing empiricist approaches of the century, soft approaches came up in the German-speaking areas of continental Europe. Differences began to be pointed out between natural and human sciences in respect of both subject matter and methods of study. Wilhelm Windelband drew a distinction between nomothetic (generalizing) and idiographic (particularizing) sciences. As concerns the larger goal of knowledge, Dilthey adopted a hermeneutical perspective and held explanation (*Erklären*) as the goal of natural sciences and understanding (*Verstehen*) as that of cultural sciences (Ermarth 1978). Corresponding to the *Verstehen* approaches, some idealist trends cropped up in the British philosophy of science. All these soft approaches provoked in turn strong response from the advocates of positivist thought.

Two of these positivist reactions are worth mentioning here, both belonging to the second quarter of the 20thcentury. The Vienna Circle of Central Europe sought to free empirical sciences as well as personal and public life from what they called "metaphysical and theological debris of millennia" and instead injectinto these a scientific world-conception (Hahn, Neurath and Carnap 1929). The second reaction came up in the U.S. under the auspices of the University of Chicago. Some of the workers from continental Europe who had migrated to the U.S. due to the Nazi outrage, jointly with others such as Bertrand Russell and John Dewey, developed a project called Foundations of the Unity of Science: Toward an International Encyclopedia of Unified Science. As indicated by the title itself, this project was aimed to bridge the schism that had been created in the empirical sciences by hermeneutical trends and "to show how various scientific activities such as observation, experimentation, and reasoning can be synthesized, and how all these together help to evolve unified science" (Neurath 1955: 2).

Thanks to the stimulus provided by these developments, positivist philosophy of science re-emerged in a prominent way in the Anglo-American world by the middle of the last century. Karl Popper's *Logic of Scientific Discovery*(1980), Ernest Nagel's *The Structure of Science* (1961), A.J. Ayer's *Language, Truth and Logic* (1971) and Carl

Hempel's *Aspects of Scientific Explanation* (1965) and *Philosophy of Natural Science* (1966)served as major opinion-shaping publications. Michael Scriven apply summed up the legacy of positivism in these words: "There comes a time in the affairs of science and philosophy when nothing is so valuable as hard-headedness. Positivism brought that heard headedness to philosophy, and perhaps to some parts of science, at a time when it was needed …" (Scriven 1969: 208-9).

Not surprisingly, the second half of the century witnessed a strong critical reaction to the positivistic trends. Fresh debates came up about topics like theory-observation distinction, objectivity, comparability, ontological status of concepts and terms, etc. These soft or post-positivist trends were pioneered by Stephen Toulmin, Hilary Putnam, Paul Feyerabend and others. Thus came into existence several realist and idealist philosophies of science rooted in hermeneutical and phenomenological approaches (for a general review, see Klee 1999). As indicated by the title itself, Feyerabend's book *Against Method: An Anarchist Theory of Knowledge* denied the existence of any method in knowledge production and declared that "Anything goes" (Feyerabend 1988). Likewise, Kuhn's book *The Structure of Scientific Revolutions* (1970) has shown how herd mentality, not objectivity, prevails to some extent in the choice and application of scientific theories.

From the foregoing rapid survey it is clear that since ancient Greek times, there is a repetitive cyclical movement between positivist (hard) and idealist (soft) conceptions of knowledge and between inductivist and deductivist methodologies for gaining it. The truth is that in the larger sense these sets of supposedly binary perspectives complement rather than exclude each other.

Francis Bacon: His Thought and Method

Sir Francis Bacon (1561-1626) straddled the 16th and 17th centuries and occupied a prominent place in both public life and academic world in Britain. He was a stormy petrel in both these domains and heralded the modern period in the intellectual history of Europe. After completing his college education from Trinity College in Cambridge and obtaining a law degree from Gray's Inn in London, he chose to enter public life rather than pursuean academic career and, despite connections in high government circles, had to wait till 1607 when appointment came as Solicitor General to King James I, then as Attorney General in 1613, as Lord Keeper in 1617, and, finally, as Lord Chancellor in 1618. In 1621 he was impeached and jailed on charges of graft but the King later intervened and terminated his imprisonment.

Bacon desired to bring about a wholesale reformation in the British society encompassing educational, administrative, legal and religious institutions. Towards this end he submitted over a period of forty years a series of memoranda and reports to Queen Elizabeth I and later to King James I. He formulated a very comprehensive project called the Great Instauration which aimed at a reformulation of the world of science. He could complete only some portions of a six-part text he had planned towards this end. Unfortunately he failed to get support from the authorities in implementing his proposals. In fact, he confessed his failure and called himself only a trumpeter rather than a practitioner, or a combatant, of new ideas (for general accounts of his contributions, see Nichol 1888-1889; Anderson 1948; Rabb 1968; Klein 2012).

Bacon drew a distinction between religious and secular learning and saw in the latter a means for acquiring mastery over nature with the goal of ameliorating the condition of man on the earth. For this purpose he stressed the need to metaphorically "storm and occupy her (Nature's) castles and strongholds, and extend the bounds of human nature, as far as God Almighty in his goodness may permit." Bacon recognized that mastery over nature rested on secure knowledge of arts and sciences and that "we cannot command nature except by obeying her." So for him the whole issue boiled down to the formulation of a reliable method of inquiry. It is to this task he devoted much of his time and his writings on this topic have found a permanent place in theories of the scientific method. There are three aspects of Bacon's work which need some additional comments: a) his overall conception of the knowledge domain and its role in society; b) his critique of contemporary learning and university education in Britain; and c) his own conception of the scientific method. We will briefly deal with these three aspects in the following pages.

New Epistemological Perspectives

As I mentioned above, Aristotle's writings were widely accepted throughout the medieval period and

were in fact compiled to form the *Organon.* But Bacon was far from enchanted with Aristotle's views about the nature and purpose of knowledge. Contrary to Aristotle's metaphysical views, he pleaded for separation of science from teleology and theology. He held that attempts to investigate final causes of physical and biological phenomena lead only to verbal disputes which arrest scientific progress. Bacon denied purposive adaptation, whether ordained by God or otherwise; it shied away from bold attempts to put nature in, what he metaphorically called, "witness box and cross-examine it." He wanted the scientist to become a child again before nature and face it, which alone will enable him to discover the *Forms* or general principles constituting the apex of the body of knowledge.

Bacon was totally opposed to Aristotle's notion of treating knowledge of nature as an end in itself. Contrary to this, he viewed knowledge as a means for man to gain mastery over nature by unlocking its riddles and powers and use its resources for improving the quality of human life. Bacon recognized that Aristotle's views not only failed to benefit mankind but actually came in the way of attempts made towards this end. He bemoans this failure in particular and says discoveries such as gunpowder, paper and printing, silk and mariner's compass hold much hope for further progress (Bacon 1885: 88-9).

Another notable aspect of Bacon's conception of science is that he treated it as a cooperative effort or inquiry. Towards this end he made many proposals before the Crown and the government but with little success. Nearly forty years elapsed since his death before his followers forming the Boyle Circle founded the Royal Society in London in 1660 and obtained a royal charter for it two years later.

Bacon recognized three major epochs or periods in the development of science and philosophy, viz., the age of the Greeks, then the Roman period, and that of contemporary Western Europe which he wanted to revamp and reshape. He rejects Aristotle's division or grouping of sciences into theoretical, productive and practical groups, and instead classifies them into history, literature (poesy) and physics (Bacon 1973: 69-209). He divides natural science into physics and metaphysics, the former grappling with variable and particular causes (Bacon 1973: 92-3). Bacon imparts special meaning to metaphysics. It reflects on general and constant causes. *Forms* are the general principles arising from these causes and are at the summit of Bacon's pyramid of knowledge. The base of the pyramid consists of singular observations and from these one moves to invariant or constant relations among phenomena and then to still higher general correlations, finally leading to the stage of formulation of *Forms*. Bacon then introduced the concept of Summary Philosophy or *philosophia prima*which is the "parent or common ancestor to all knowledge" and deals with "common principles and axioms which are promiscuous and indifferent to several sciences" (1973: 92). This concept obviates teleological focus and opens up new possibilities for the application of general laws in the encounters with empirical world.

Now a few words about Bacon's views about the nature of matter and cosmology. He holds that one could explain various processes operating in nature only after gaining insights into the hidden structures and secret workings of matter. He accounts for natural order by attributing it to the interplay of matter and motion. He locates permanent movement in matter at the atomic level. In its final version Bacon's theory of matter is more corpuscular than atomistic; particles are endowed with powers that make a variety of motions possible after combining with air and fire. These views are a part of his conception of cosmology, magic and alchemy.

In short, Bacon prefers Democritus' natural philosophy of the pre-Socratic period to Aristotle's scholastic method based on deductive logic and reliance on authorities. He says that these dogmatists are like spiders which spin webs out of themselves. The empiricists, he continues, are equally untrustworthy because like ants they amass only and consume. The true job of science is akin to the efforts of bees which not only gather materials from nature but add to these their own input to produce a valuable item like honey. Bacon sums up the metaphor by saying that science "…does not depend entirely or even chiefly on the strength of mind, nor does it store up in the memory the materials provided by Natural History and Mechanical Experiments unaltered, but change and digest them by the Intellect…" (Bacon 1885: 78).

Bacon's Critique of Contemporary Learning

Even as a student of Trinity College at Cambridge Bacon expressed grave doubts about the

quality of learning that was being imparted there and raised objections against its close association with theological scholarship. In the next 30 years his ideas about learning and its contents and methods became sharper and more explicit. It was against this background that he published his book *The Advancement of Learning* in 1605 (Bacon 1973).

As indicated by the title itself, this book is concerned with the promotion of learning: its virtues, critique of the existing system of knowledge, removal of hindrances to its advancement, organizational support required for research, and a new method for facilitating its acquisition. He elaborated on the new method in a second book called *Novum Organum* published in 1620.*The Advancement of Learning,* the only book which Bacon published in English, consists of two parts. The first part is addressed to King James I. Bacon says that his intention in writing this book was to pay way for a "good society, well-governed, orderly, religious, chaste, courageous, soldierly and rich" and states that such a society is possible only when promotion of learning would be set as the goal.

Bacon begins by defending learning against the negative attitudes of three kinds of persons: theologians, politicians and learned men themselves (Bacon 1973: 4-60). He dismisses the various theological arguments raised against learning: that it was the cause of the fall of man; that, like serpent's poison, its influences make men swell; that it increases man's anxiety; and that it makes men heretics and tends them to contemplate second causes and deviate from dependence on God who is the first cause. Bacon then says that politicians dislike learning because they think that it "doth divert men's travails from action and business, and bringeth them to a love of leisure and privateness; and that it doth bring into states a relaxation of discipline, while man is more ready to argue than to obey and execute…" (1973: 8).

Thirdly, discredit or disgrace to learning is brought by learned men themselves either because they fail to keep up civility and honour of life once they gain some riches or because they fail to observe decency in their behaviour and discretion or because they bring upon their work (negative) influences from their own countries and their own masters. Bacon also finds errors and vanities in some of the studies completed by learned men. He groups these imperfect studies into three kinds: a) fantastical learning (vain imaginations); b) contentious learning (vain altercations); and c) delicate learning (vain affectations).

Bacon then appeals to King James to extend his overall support to "endowment of the world with sound and fruitful knowledge" (1973: 61) by providing suitable grants to places of learning, libraries and learned persons. He pleads for the creation of a Salomon's House which will facilitate interaction and exchange of ideas among scholars. Most important, Bacon points that the majority of colleges still concentrate on religious or ecclesiastical subjects and that arts and sciences have been given but inadequate attention. He laments that philosophy and universality have been treated as "idle studies" (1973: 63) and that their neglect has hindered the progress of learning.

Another aspect of Bacon's analysis of learning concerns his division of knowledge into various branches (1973: 65-209). He says that history, poesy (literature) and philosophy correspond respectively to memory, imagination and reason which are the three essential components of human understanding. He makes a statement about the relevance of historiography of learning which is worth quoting: "But a just story of learning, containing the antiquities and originals of knowledge and their sects, their inventions, their traditions… all other events concerning learning, throughout the ages of the world … will make learned men wise in the use and administration of learning…" (1973: 70).

Bacon recognizes four divisions in history: natural, civil, ecclesiastical and literary. Memorials (commentaries and registers) and antiquities or "history defaced" are the basic sources of civil history. Those who deal with historical science will be glad to note that he pays a compliment to the laborious nature of historical reconstruction by calling historians "industrious persons (who) by an exact and scrupulous diligence and observation, out of monuments, names, words, proverbs, traditions, private records and evidences, fragments of stories, passages of books that concern not story, and the like, do save and recover somewhat from the deluge of time" (1973: 73). Poesy (or literature), arising as it does from imagination, takes licenses to "make unlawful matches and divorces of things."(1973: 82), it is of three kinds: narrative, representative and allusive.

Philosophy, the third broad domain of learning recognized by Bacon, is again divided into three branches: divine (theology), natural and human. Natural philosophy or science deals with the mysteries of nature–operation of causes and production of effects. Following Aristotle, Bacon opts for a fourfold division of causes – material and efficient causes, and formal and final causes. The former set of causes is the subject matter of physics and the latter that of metaphysics. He makes mathematics a part of metaphysics. Human philosophy comprises branches of knowledge which deal with body (medicine, cosmetic art, athletics and sensual arts) and mind. Studies of the mind deal with its nature and functions (intellectual and moral).

Bacon concludes the book by saying that he has attempted a true and faithful account of the contemporary intellectual world, drawing attention in particular to its gaps and shortcomings. He further clarifies that his aim was one of improvement and amendment but not radical change and break. He takes responsibility for all errors but attributes whatever good that may be there in the book to God and the Crown.

The Advancement of Learning is a remarkable piece of writing in the whole history of learning from more than one point of view. It is "an epic poem in prose, where cerebration takes the place of fable" (Johnston 1973: xii). Its principal message is loud and clear. First, it is amazing that a person from outside the academy evinced such deep interest in learning at higher levels and spotted its inadequacies and limitations in all details. He further dared to bring these to the notice of the Crown and government. Secondly, the unfriendly attitude of religious circles towards learning and the suspicions which the political groups harbour about learned persons as highlighted out by Bacon unfortunately still persist in many regions of the world. As we shall soon note, India is one such region. Equally valid is Bacon's list of frailities and vanities of the learned ones themselves.

Thirdly, for his time Bacon's division of knowledge into three major branches (history, literature and philosophy) was quite appropriate. His comments on the laborious nature of historian's task and his sources are true and appropriate. All archaeologists should be pleased to note that Bacon included antiquities too as a source material. He treats these as "history defaced, some remnants of history which have casually escaped the shipwreck of time (1973: 73). Finally, Bacon has devoted 60 pages of the text (1973: 117-179) to the topic of mind and its functions. This is one of the first major attempts at developing a theory or philosophy of mind. His comments on body-mind complementarity, mind's powers of reason and understanding, divination and fascination, and invention still merit much attention.

New Method

As the saying goes, in the application of the scientific method identification of an issue or a problem correctly is as good as half solving it, and then comes the formulation of a suitable research strategy. Having made a full survey of the ills of contemporary learning in Britain and their sources, Bacon turns his attention to devising a methodological framework for bringing about improvements. For this purpose he published his other famous work *Novum Organum*in 1620 (Bacon 1885). Bacon desired his text to supplant *Organon* representing the medieval compilation of Aristotle's opinions about man, world and God. Already in his text *Cogitataet Visa* published in 1607Bacon rejected Aristotle's syllogistic method and suggested an alternative to it involving laborious accumulation and treatment of basic facts and drawing from them inferences about the world around us. *Novum Organum*is devoted to the elaboration of this task.

In the Preface to the work Bacon (1885: 3-10) refers to the opposing schools which made pronouncements about nature: a) vainglory of dogmatists who claimed that already everything was known about the world, thereby "extinguishing and destroying inquiry"; and b) sceptics who despaired that nothing at all could be known. The ancient Greeks adopted a middle course and did initiate inquiry. But, as Bacon complains, they stopped at the "outer courts of Nature" and left its "secret chambers" unexplored because they relied only on their powers of intellect to arrive at Anticipations of Nature. Bacon wants to continue on the path of the Greeks but adopts a combative attitude towards nature and formulatesa rule-based approach for obtaining, processing and threading together raw sense data in order to arrive at what he calls Interpretations of Nature. His plan "consists in laying down grades of certainty, in defending the senses by reducing them to their proper functions, in rejecting for the most part that operation

of the mind which follows directly after the operation of the senses; and then in opening and laying down for the mind a new and certain way from the perceptions of the senses" (Bacon 1885: 4).

In the first part of *Novum* Bacon seeks to rid sciences of signs and causes of errors and for this purpose he draws attention to the fallacies of human senses and reason, syllogism and traditional philosophical systems. The Aristotelian method of induction failed to recognize that nature is more subtle than human intellect and therefore jumped from particulars to the highest generalities or axioms; it erred further by using syllogism while relating higher axioms to lower axioms. Bacon then says that progress of scientific knowledge was vitiated by three kinds of false philosophy, viz. sophistical, empirical and superstitious traditions which respectively relied on vulgar conceptions, a limited number of experiments and superstitions (1885: 32-7).

Bacon treats fallacies governing human reason as the most pernicious obstacles to the growth of knowledge. He calls these Idols or phantoms of human imagination or crackled mind (1885: 19-31). He considers these as dangerous because these lead to corrupt and ill-ordered predispositions of the mind, which in turn pervert and infect all intellectual perceptions. Bacon recognizes four types among these fallacies: a) idols of the tribe; b) idols of the cave; c) idols of the market place; d) idols of the theatre. Idols of the tribe are inherent to human nature as such. These refer to prejudices and affections of the human mind and proneness of senses to fall a prey to distorted impressions of reality. The second category, idols of the cave, refers to the predicaments, perceptions and prejudices of individual persons arising from their respective peculiar constitutions, education, upbringing and habits. These individual peculiarities have their sources in factors like fondness for a particular subject or a particular period or a particular personality in history, excessive feelings to unite or differentiate and inclination to view things/situations in a larger or narrow perspective. Idols of the market place refer to false conceptions or notions that sometimes arise in the course of social intercourse between individuals. These enter human minds quietly in the form of words and names (e.g. love *jihad*) and shape one's perceptions of the outside world. To put it in Bacon's own words: "But words clearly put a force on the intellect, disturb everything, and lead men on to empty and innumerable controversies and fictions" (1885: 20). These three idols or phantoms are inherent to or part of human nature and as such could be controlled to some extent. It is a different matter with idols of the theatre. These are outside of human nature and refer to influences, basically negative ones received from writings of various kinds, e.g. philosophical as well as scientific schools of thought.

After warning about the various psychological, cultural and linguistic pressures that vitiate man's use of his reasoning faculty, Bacon turns to the more important task of devising a strategy for "conquering nature by obeying her" i.e. a comprehensive and fool-proof method for gaining a body of reliable and useful knowledge about nature and its structure and functioning. This is the method of induction which he put up as an alternative to demonstration by syllogism. In most of the writings Bacon's inductive method has been treated in a simplistic way consisting of acquisition of sense data, their enumeration and drawing some generalizations. It is now being recognized as a sophisticated framework in its own way, already anticipating some of the developments that came up in the twentieth-century philosophy of science.

Bacon's method implies both a step-wise ascent from particulars to axioms and a descent from axioms which entail new particulars, these in turn necessitating reformulation of axioms. Induction by simple enumeration procedure is "childish" and no longer accepted as a reliable procedure for transforming sense data into sensible generalizations because even a single contrary instance can vitiate their validity. Sense data is processed into facts by organizing it in the form of tables. These tables are of three types: a) tables of absence and presence; b) tables of deviation, or of lack of proximity; and c) tables of degree or comparison. These tables allow one to spot "rejections and exclusions" and then arrive at those genuine generalizations which have no contrary instances. While emphasizing the importance of sense data, the inductive method does not exclude the relevance of experimental observations. True understanding consists of slow and gradual steps from particulars to lesser axioms, then to middle level axioms and finally to most general axioms. In this process a crucial role is played by middle level generalizations or "living axioms"

which mediate between particulars and general axioms. This in short is Bacon's method of arriving at Interpretations of Nature. Among the final results issuing out of this arduous process, he gives primacy to what he calls prerogative instances which cover phenomena of various kinds and as such possess generality conducive to future investigations.

King James I who received the text of *The Novum Organum* is said to have confessed that "like God's word, it passethone's understanding." Be that as it may, like *The Advancement of Learning,* it occupies a special place in the entire literature dealing with the scientific method. Bacon's warnings about biases and prejudices influencing human senses and reason are applicable to all ages. As concerns his inductive method, there are two or three aspects which are striking.

First, Bacon elevated induction beyond the level of simplistic enumeration and assortment of basic sense data and prescribed a rigorous process for transforming these into facts and these in turn into generalities. Then he introduced the innovative principle of exclusion which obliges the investigator to exclude all possible contrary cases before threading together facts to arrive at general principles about structural properties of nature and their interrelationships/causes. In this respect he already anticipated the basic idea behind the method of conjectures and refutations formulated by Karl Popper in the last century (Popper 1963).

Secondly, Bacon's inductive method treats scientific inquiry as a dynamic process and provides scope for further investigations into nature. It provides for both an upward movement from observational and experimental data to axioms or generalities and from the latter back to raw data, as necessitated by surfacing of anomalous situations. In Bacon's own words: "…But axioms duly and orderly abstracted from particulars in their turn easily point out and mark off new particulars; and so render the sciences active" (1885: 16). In other words, as argued by Ducasse 1960: 71-4), he recognized the importance of hypothesizing by treating even higher level generalities as only provisional answers whose consequences need to be evaluated in the light of fresh facts.

Thirdly, recognizing the infinite nature of the phenomenal world and the "uncertainly certain" nature of the generalities which one arrives at after an arduous process, Bacon lays emphasis on the fact that in our studies dealing with nature we mostly deal with middle order generalities. This is a message which is relevant to all inductive sciences which are often by plagued by idiographic versus nomothetic and diachronic versus synchronic controversies. Quoting Plato's *Phratetus*, he writes in *The Advancement of Learning:* "…That particulars are infinite, and the higher generalities give no sufficient direction: and that the pith of all sciences, which makes the artsman differ from the inexpert, is in the middle propositions, which in every particular knowledge are taken from tradition and experience…" (Bacon1973: 123). Social sciences like sociology and archaeology have recognized the truth value of this observation and have developed middle range theories of their own (Merton 1968; Binford1981; 2001; Stone and Paddayya 2020).

To put the matter in a nutshell, Bacon has the distinction of capturing, four centuries ago, all the major precepts of what we now call the scientific method, viz., biases vitiating scientific objectivity; complementary roles of observation and experimentation; need for extracting generalities from "teeth of stubborn and irresistible" facts; cyclical relationship between particulars and generalities; and viewing even higher order generalities as tentative or hypothetical answers that need to go under the hammer of new facts or particulars, thereby making learning a continuous process ever expectant of revealing new secrets of the empirical world. ❑

Teacher Education: Reforms are in Waiting for a Long

Harshit Mishra*

This paper presents an analysis of the determinants of Teacher Education Institutions (TEIs) in India. It examines reports of important education commissions, education policies pertaining to the teacher education sector of the country. A deep dive in to National Council for Teacher Education (NCTE) has also been attempted in search of core of the core problems with their better understandings and probable solutions. The paper also deals with the problem of substandard and dysfunctional B.Ed. colleges. Finally, the paper attempts bottleneck and way forward regarding the sector.

Teacher Education Institutions (TEIs), National Council of Teacher Education (NCTE), Education-Policies, Justice Verma Committee (JVC), National Education Policy (NEP), Higher Education Institutions (HEIs).

Teacher Education reform is central to improving School Education in India. In the last thirty years, the socio-economic environment in India and the world around has changed significantly. The economy has opened up and social structures have changed. While a lot of wealth seems to have been created, disparities between rich and poor have deepened. This period has seen increased participation in political, social and economic processes but many communities remain excluded. It is critical that our education aims to develop good human beings and a good society. This requires education to play a direct and central role for individual empowerment and social change. Education must play a direct role in moving society towards equity, justice, humaneness, economic dynamism, sustainability and a true democracy. We are already committed to these ideals in our Constitution, education must help in fulfilling this commitment.

In our country, the move to universal education has articulated major shifts in thinking about teaching and learning. Some of these key shifts in thinking are:

- Every child is capable of learning - children learn best when they are respected, valued and involved in the learning process;
- School as an 'inclusive' space - classrooms must have room for voicing children's thoughts, curiosity, and questions - diversity and inclusion must be seen as an asset;
- Focus on collaboration, creativity and conceptual understanding based on ideas of construction of knowledge and active learning.

This means new challenges for teachers. If we want to have the kind of education based on constitutional values that we have written about in our National Policy documents, then we need the kind of teachers who can provide for it.

After independence, our educationist forefathers had put a lot of emphasis on improving the quality of teachers and teacher education. A lot of work had been done in the decades of sixties, onwards in the area of Teacher Education. The glimpses of some of the pioneer work are as under:

- **The Education Commission (1964-66) Report**[1] found teacher education sector in complete isolation from University life, from Schools and from one-another and recommended breaking the isolation from Universities and breaking the isolation from Schools.
- Further under, **National Policy on Education (NPE) 1986**[2] **& Programme of Action (PoA) 1992**[3]**,** a centrally sponsored scheme of Teacher Education was launched in 1987 to orient teachers in the main priorities and to improve their professional competence. District Institutes of Education and Training (DIET) were recommended to be established with the capability to organize pre-service and in-service courses for elementary school teachers and for the personnel working in non-formal and adult education. Selected Secondary Teacher Training Colleges were recommended to be upgraded to complement the work of State Councils of Educational Research and Training (SCERT). The PoA-1992 envisaged statutory & autonomous status being conferred for the NCTE.
- **Twelfth Five Year Plan (2012–2017)**[4] envisaged:
  - Improving the quality of pre-service teacher education and quality of in-service teacher

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professional development with options for their upward career mobility;

- Teachers need to be adequately prepared to deal with the realities of their schools; particularly rural areas, multi-age, multi-grade and multi-ability classrooms, to teach effectively to improve learning outcomes for a diverse group of children.
- Accreditation arrangements need to be strengthened and new credible agencies could be roped in for the purpose. There is an immediate need to lay down performance standards and benchmarks for teacher education institutions with clear accountability.

Remarks

It is clear that starting from the Education Commission 1966, every commission/cited, has been continuously highlighting the key problems and recommended the pathways for transformation. But, it has been failure of implementation of these many recommendations in letter and spirit. As a result, teacher education sector is still in moribund state. Let us begin with NCTE which got statutory & autonomous status due to PoA 1992.

National Council for Teacher Education (NCTE)

The NPE-1986 and PoA-1992 thereunder envisaged NCTE with statutory status. The NCTE as a statutory body came into existence in pursuance of the NCTE Act, 1993 on the 17th August,1995.

Its Main functions[5] include: to make recommendations for suitable programmes in teacher education sector co-ordinate and monitor teacher education specify guidelines of qualifications for teacher and teacher educator, specify norms for courses/ trainings including eligibility criteria for admission and method of selection of candidates course-duration, curriculum, promote and conduct innovation and research, guidelines regarding fees and to 'take all necessary steps to prevent commercialisation of teacher education'.

Functions need to be better understood in this silver jubilee anniversary year of the NCTE that what exactly, it has not been doing since last 25 years and the 'last function but really not the least' is very interesting.

Justice Verma Commission (JVC) Report [6-7]

The report of the Justice Verma Commission stands as a landmark in the history of Teacher Education in the country. The JVC was a high-powered commission appointed by the Hon`ble Supreme Court in 2011 while hearing special leave petitions led by 291 teacher education institutions against a High Court order.

The report emphasized the symbiotic relationship between school and teacher education. It highlighted the fact that while 80 per cent of elementary school children were educated in State schools, 90 per cent of teacher education institutions are in the non-government space, thus necessitating an appropriate regulatory framework for quality standards in teacher education. It pointed out that NCTE, even as a statutory body, had not been able to control the proliferation of sub-standard teacher education institutions, leading to commercialization of teacher education in the country.

An indication of the magnitude of uncontrolled proliferation of teacher education in the country can be inferred from the fact that the number of programs recognized by NCTE was 11,863 in 2007-08 had grown from 1215 in 1995- 96 and 25,259 in 2017, a 113 per cent increase from 2007-08.

The report states that while the expansion of a system per se may not be 'objectionable' but it becomes problematic when the major part of this expansion is of poor quality institutions. It is pertinent to note that this expansion has largely happened in the 'private self-financing sector.' The report attributes this growth to the fact that NCTE allowed self- financing institutions to offer teacher education programs in consonance with the policy of liberalization and privatization in other sectors. This it did without ever trying to find out if the new institution being recognised by it had the financial resources to run the programs it had applied for. This happened even though it was common knowledge that the fees that TEIs were allowed to charge could not even meet a small proportion of the salaries that the faculty in these TEIs were supposed to be paid.

One result of this uncontrolled growth has been the oversupply of elementary and secondary teacher preparation programs. The other is the failure of TEIs to onboard the full complement of teaching faculty and their under payment. There is also a deficit of programs in early childhood education and physical education

and for teacher educator preparation programs. The concern expressed by the report regarding the quality of teacher education is manifested in the poor quality of teachers, and therefore poor learning outcomes in schools.

Teacher competence is the key issue – many teachers struggle to create effective learning environments for their students. Teaching seems to have become mostly uninteresting and routinized leading to poor classroom processes and little learning. Most teachers seem to take very little pride in what they do.

This is mostly because they have not engaged deeply with ideas in education - its history, aims, connect with society and its ethical moorings. Teachers need to have an appreciation of issues around child development and the social context of learning in addition to conceptual understanding of their subject; our teacher education system has failed them on this count. Institutions that run these programs also need to have the financial resources to do what they are supposed to do.

Good teachers are prepared and developed by good teacher educators - we have a huge dearth of good teacher educators. Unless this is fixed, education will continue to flounder. Few institutions offer the M.Ed. program which is the basic qualification to become a teacher educator and where they do, the quality/ usefulness is often open to question. Avenues for the professional development of teacher educators are few and opportunities for them to enhance their pedagogical and content knowledge are severely limited[8].

Continuous teacher professional development does not meet the requirements of practicing teachers. Most teachers do not see benefit in most of the 'in-service' training programs provided with the major lacuna being the lack of a proper need analysis, poor content/resource material quality and poor quality in the way it is transacted[9].

Stand-Alone TEIs

This has led to both intellectual and professional isolation from the rest of higher education. Stand-alone teacher education institutions cannot afford to build the kind of varied faculty that good teacher education needs. In practice, faculty end up rote-teaching the textbook, as they come without disciplinary understanding.

NCTE is currently seen as a part of the problem, being rigid, inspectorial, limiting its regulatory focus mostly on infrastructure requirements with a tendency to micro-manage issues like faculty qualifications, equipments in the lab etc. - a body that focusses on a checklist of approvals and little else. This has resulted in many teacher education institutions only aiming to meet minimal compliance requirements (either in fact or on paper). Instead of NCTE taking the lead and providing an enabling environment, it is mostly left to the initiative, interest and staying power of a few individual teacher education institutions to pursue professional excellence.

Summary of JVC Recommendations[6-7]:

1. Institute a transparent procedure of pre-entry testing of pre-service teacher education programme.
2. Teacher education should be part of Higher Education system. The duration of programmes needs to be enhanced, in keeping with the recommendations of the Education Commission (1966), the implementation of which is long overdue.
3. New institutions to be located in multi & inter-disciplinary academic environment. Existing institutions may be encouraged to take necessary steps towards attaining academic parity with the new institutions.
4. As a matter of policy, the first professional degree/ diploma in teacher education should be offered only in face-to-face mode.
5. There is a need to make the Masters in Education (M.Ed.) Programme of 2-year duration.
6. Need to revise norms for qualification of teacher-educators with post-graduation degrees in education/science/social-sciences/languages/ mathematics, along with a professional degree in teacher education or a research degree in education.
7. Develop a new framework for undertaking inspection of the institutions.
8. Set up a Teacher Education Assessment and Accreditation Centre (TEAAC) and constitute a committee to prepare a comprehensive framework of accreditation.
9. Appropriate amendments be made in the NCTE Act to provide for the following:
    - Empower the Council to issue directions to the Regional Committees which shall be binded on the Regional Committees;

- Enable the Council to revise an order passed by the Regional Committee under Sections 14 and 15 of the Act, where the Council is satisfied that the Regional Committee has granted recognition in contravention of the provisions of the Act.
- Section 17 of the Act be suitably amended to enable inspection of institutions.
- Formulate appropriate regulations for implementing Section 17 of the Act.

NCTE Regulations 2014

- Based on the recommendations of JVC, NCTE notified regulations-2014. It has allowed 4-year B.A/B.Sc. B.Ed., 3-year B.Ed. (Part-time) and 3-year B.Ed.-M.Ed. programmes and duration of three programmes – B.Ed., B.P.Ed., M.Ed. – has been increased to 2 years[10].
- Henceforth, in place of stand-alone institutions, teacher education shall be established in composite institutions (multi-disciplinary or multi-teacher education programmes)[10].
- Each Teacher TEI to have compulsory accreditation in every 5 years from an accrediting agency recognized by NCTE[10].

Remarks

- NCTE tried reforms in piecemeal manner that is why no big-ticket reform has actually been taken place in the haywire status of teacher education. No compulsory accreditation system has been put in place. Sub-standard and dysfunctional TEIs particularly stand-alone TEIs which actually has been the crux of the all chaos, are continue to exist as B.Ed. shops. As a result, NCTE has lost a golden opportunity bestowed by JVC recommendations for reforming the sector.

National Education Policy (NEP)-2020[21]

Recommendations central to Teacher education are as under:

Most institutions today providing Teacher Education are small colleges in the private sector that offer only a single narrow programme. According to AISHE (2015-16), of the 17000+ colleges in India that teach just a single programme, nearly 90 per cent are teacher training institutes! Moreover, according to the Justice J. S. Verma Commission (2012), a majority of these standalone teaching institutes - over 10,000 in number - are not even attempting serious teacher education, but are essentially selling degrees for a price. The present Landscape of Teacher Education in India is given in Table-1.

Table-1 Teacher Education Landscape [12-13]

No. of Teacher Education Institutions	**17,244**
Number of Approved Courses	**17**
Total number Teacher Education Programmes	**24,199**
No. of sanctioned Student Intake in TEIs	**18.53 lakhs**
No. of Teachers	**92.56 lakhs**
Requirement of Teacher per year	**3.00 lakhs**
Surplus Teacher per year	**15.5 lakhs**

(Source: SE ShaGun Dashboard, MHRD and ncte.gov.in)

Restoring Integrity and Credibility

The integrity and credibility of the teacher education system has unfortunately taken a great hit and witnessed a severe decline due to the thousands of "Teacher Education Institutions" that are solely commercial operations where little if any teacher education is taking place. If teacher education is to improve and reach the levels of integrity and credibility required to restore the prestige of the teaching profession and thereby attain a successful school system, such sub-standard institutions will have to be closed immediately while good institutions with positive intent strengthened.

Multi-disciplinary Approach

Teacher education requires multidisciplinary inputs and a combination of high-quality content and pedagogy that can only be truly attained if teacher preparation is conducted within composite multidisciplinary institutions. All currently existing genuine teacher education institutions must aim to become multidisciplinary higher educational institutions by 2030.

Sub-standard & dysfunctional TEIs that do not meet basic educational criteria will be closed. India should have only educationally sound teacher preparation programmes in operation, developing professionally competent teachers - all others must be shut down.

Moving all Programmes into Multi-disciplinary HEIs

The four-year integrated B.Ed. will, by 2030, become the minimal degree qualification for school

teachers. All pre-service teacher education programmes will henceforth be offered only in multidisciplinary HEIs. By 2030, every HEI offering a teacher education programme will be multidisciplinary and offer the four-year integrated B.Ed. programme. All HEIs currently offering the two-year programmes, including the diploma programmes, will be able to transition into multidisciplinary institutions offering the four-year integrated B.Ed. programme. The two-year B.Ed. programme will be for lateral entry into teaching. Some issues which need attention in this regard are:

i. As repeatedly mentioned in the NEP-2020, there are large numbers of dysfunctional, corrupt, substandard & poor quality TEIs. Primarily, these are Single discipline Standalone institutions. In the absences of any assessment and accreditation mechanism, these TEIs keep on producing poor quality teachers on annual basis. These dysfunctional TEIs have all types of irregularities like insufficient no. of teacher-educator, proxy teachers, proxy students, proxy attendance, inadequate infrastructure, no classes/irregular classes, no field/school based practical, proxy examinations etc. All possible types of corruption/ irregularities/malpractices are said to be practiced in these TEIs.

ii. As per AISHE data[14], out of about 17 thousand TEIs, approximately 8700 are offering only 01 teacher education Programme and ~2500 are offering only 02 teacher education Programmes. These 8700 TEIs are single discipline and stand-alone teacher education institutions and are the crux of the teacher education problem of the country. Broadly speaking, these ~11,000 (8700+2500) standalone single discipline TEIs are the crux of the problem and are nothing but single discipline, stand-alone B.Ed- D.El.Ed. shops as also mentioned in the NEP-2020.

iii. The uncontrolled proliferation of the TEIs can be understood with the State-wise data that National Average of TEIs per State/UT is 347 but there are lot of variations across States (UP: 2858, Maharashtra: 1142, Madhya Pradesh: 904, Rajasthan: 893, Tamil Nadu: 807, West Bengal: 722, Bihar: 246, Punjab: 243, Jharkhand: 130, Odisha: 81, Sikkim: 08, Goa: 07, Dadra& Nagar Haveli: 01).

iv. By State-wise mining the same data set, Uttar Pradesh has shocking proliferation of TEIs among its districts (Ghazipur: 216, Agra: 167, Meerut: 166, Azamgarh: 141, Ferozabad: 97, Faizabad: 95, Gorakhpur: 80, Mau: 77). Just imagine, Ghazipur has 216 TEIs. Similarly, Nagpur (105), Pune (81), Nashik (60), Ahmednagar (54) are some of the mushrooming centers of Maharashtra.

6. On further deep-diving, with ~ 100 seats each, the TEIs potentially produce ~18.5 lakh graduates per year. At the recommended teacher-student ratio of 1:28, the country's 25.09 crore students need only 90 lakh teachers overall. At present total no. of teachers are 92.56 lakhs. If each teacher serves about 30 years, the annual turnover and need for new teaching candidates is only about 3.5 lakh. There are simply too many teaching graduates seeking for too few jobs. It means that India is producing 14~15 lakhs surplus trained teachers annually.

7. There is no provision of mandatory accreditation of TEIs with in a definite time period. The TEI, once granted recognition, has no mandatory obligation to get accredited. NCTE as regulator and universities as affiliating bodies actually know nothing about these17 thousand TEIs that what exactly is going on in these institutions. JVC has recommended that each TEI have to undergo compulsory accreditation in every 5 years but the recommendation, like many other important recommendations, is still waiting since 2012 to get implemented.

8. As per NCTE Act, 1993[15], There is no direct role of the National Council in granting recognition. The decentralized structure of the Act gives all powers for granting affiliation to the Regional Committees (RCs) only, resulting in the Council's role being limited to policy formulation only. This is highlighted in the various sections of the NCTE Act as listed below:

Recognition Powers

- Section 14: The powers to grant recognition to the institution(s) offering courses or training in Teacher Education are vested only within RCs.
- Section 15: The powers to grant recognition for a new course/training to a recognized institution are vested only within RCs.

Withdrawal Powers

- Section 13: This section grants the power to the National Council for inspection of the institution(s) but the National Council has no powers to withdraw recognition of

such recognized institution(s) on account of misconduct or non-compliance of the Act.

- Section 17: Powers for withdrawal of recognition from the TEIs are only vested with the Regional Committees, if it is satisfied that the recognized institution has contravened any provisions of the Act.

9. The National Council plays no role in the process for granting recognition of Teacher Training/ Education Institutions. All powers for granting recognition, as determined by the NCTE Act 1993, lies under the jurisdiction of the RCs[15], who process the application submitted by the institution regarding recognition, select 02 Teacher Educators from the empaneled list to conduct field inspection of infrastructure, buildings, libraries & other facilities of the institution and submits its report. On the basis of the report submitted by the Teacher Educators, the RCs grant recognition.

o The empaneled group of teacher educators comprises teacher educators both from the government and private institutions, having requisite experience and qualifications. There is no formal procedure laid down for the random selection of teacher educators for field inspections. The nomination of the teacher educator from the empaneled list is purely up to the discretion of the RCs. This forms a loophole for the prevalence of corruption in the inspection process.

10. The structure of the Act leaves very little scope for review/monitoring the activities of the RCs, especially in the recognition process. Lack of review/supervision has made RCs almost uncontrolled and as an outcome we are witnessing mushrooming of sub-standard TEIs/TTIs across the country.

11. The Council still does not have any system to collate data and has been unable to deploy adequate technology to strengthen MIS. There is no credible national/ regional data on the number of TEIs/ TTIs operating, faculty details, students' detail, alumnae details, etc. As a result, data/evidence-based policy making and thoughts on possible career destinations of Indian teachers in foreign destinations have been remained out of thinking.

12. *Quality of Teachers[16]:*

- With all the mayhem created by the TEIs/Regulators as mentioned above, how can one expect from the pass-outs of these sub-standard dysfunctional TEIs to deliver quality education and desired learning outcomes. The learning outcomes of the students particularly in Govt. schools are very poor and remains a big challenge to be addressed immediately.

- ASER-2018 survey reports[17] 50 per cent of Standard V students could not read Standard II level text and 76 per cent of Standard V students could not do subtraction. Also, NAS 2017[18] conducted by the Government agencies, is also not showing encouraging results as average performance of classes VII and X students in Language, Mathematics and Science are only 56 per cent, 42 per cent, 44 per cent and 49 per cent, 34 per cent, 34 per cent respectively.

- A pass percentage of only 14.8 per cent in Central Teacher Eligibility Test (CTET)-2019[19] itself explains the health of TEIs across the country.

Recommendations and Way Forward

- **Mandatory Accreditation[6,7,11,21]:** A rigorous, transparent and well-administered accreditation system through a network of identified credible resource institutions (like NAAC/INFLIBNET/ DMEO-NITI Aayog etc.) must be launched having mandate of accrediting all TEIs in not more than 02 Years. As recommended by the JVC, all TEIs have to be mandatorily accredited in every 5 years from an accrediting agency recognized by NCTE. This needs to be implemented immediately which has been waiting at least since 2012 for implementation.

- **MIS:** The accreditation must be implemented in at least two phases; digital and physical. Maximum possible part of accreditation should be covered digitally. This will also create a permanent real-time dynamic and credible database/MIS of the sector that is something which is drastically lacking and one of the criticalities for this whole crisis. Also, NCTE must create a robust MIS with proper arrangement of third-party data verification, at the earliest. The council has launched Performance Appraisal Report (PAR)[11] but only ~ 6500 TEIs have responded with all self-reported data and more than 10,000 TEIs have not responded at all.

- **Closure[11]:** Based on the accreditation results, dysfunctional and sub-standard TEIs must be de-

recognized & closed down at the earliest. This must be done in most transparent manner. As envisaged in NEP-2020**,** India should have only educationally sound teacher preparation programmes in operation, developing professionally competent teachers - all others must be shut down.

- **ITEP**[20]**:** NCTE has notified a new programme for teacher education named Integrated Teacher Education Programme (ITEP). It will be a four-year teacher training programme. 04 Year B.Ed. degree Program is a welcome step for improving the condition of teacher education in the country. ITEP will be located in multi and inter disciplinary academic environment. NEP-2020 also envisions that by 2030, the minimum degree qualification for teaching will be a four-year liberal integrated B.Ed. degree that teaches a range of knowledge content and pedagogy and includes strong practicum training in the form of student teaching at local schools.
- **Multi-Discipline**[6,7,11,21]**:** In view of the above, all single-discipline standalone TEIs (about 11,000) will not be eligible for 04 Year B.Ed. Program and hence cannot be allowed to run this program. All independent TEIs will be required either to convert (if survived from above recommended mandatory accreditation) to multidisciplinary institutions by 2030 or will be shut down as there will be no single discipline teacher education programme in the country.
- **Change of Guards**[1,6,7,11]**:** Currently, Teacher Education and NCTE are under the Department of School Education & Literacy, MHRD. All B.Ed. colleges have their own affiliating universities which largely affect the TEIs on day to day basis. In future, all B.Ed. colleges will be multidisciplinary colleges having B.A./B.Sc./B.Com. branches also. It is therefore, recommended to put teacher education and NCTE in the domain of Department of Higher Education, MHRD. This will create much needed governance synchronization, pathways for collaborative efforts and ease of business in the teacher education sector.
- ***Amendment needed in NCTE Act-1993***[6,7]: Appropriate amendments may be made in the NCTE Act to ensure greater transparency and accountability. Proposed changes include:
  - The Regional Committees should be abolished. The RCs are prime accused of most of the mess in teacher education sector.
  - Include the provision of mandatory accreditation of each and every TEI in every 5 years cycle.
  - The National Council may also be granted powers to penalize/ withdraw recognition of TEIs/TTIs, under Section 17 of the NCTE Act, in case of contravention of provisions of the NCTE Act.
  - No need of Members of Parliament to be the member of NCTE. All concerned sections of the should be deleted.
  - Include to identify sub-standard, dysfunctional, stand alone & single discipline and non-existent TEIs, in the Act, for closing them in a time bound manner.
  - Allow surprise inspection of TEIs without any prior notice and as a result section 13 (2) should be deleted which obligates the NCTE to prior inform the TEI regarding inspection.
  - Section 34 of the Act should be examined and scrutinized properly as this section has been used for various messy regulations/ notifications which often violates each other.
- ***National Education Policy 2020***[21]***:*** Now as per NEP-2020, distinct functions of Regulation, Accreditation, Funding, and Academic standard setting will be performed by distinct, independent, and empowered bodies. This is considered essential to create checks-and-balances in the system, minimize conflicts of interest, and eliminate concentrations of power. These four structures will be set up as four independent verticals within one umbrella institution, the Higher Education Commission of India (HECI). The first vertical of HECI will be the National Higher Education Regulatory Council (NHERC). It will function as the common, single point regulator for the higher education sector including Teacher Education. It will require repealing of existing NCTE Act and restructuring of various existing regulatory bodies to enable this single point regulation. NHERC will be set up to regulate in a 'light but tight' and facilitative manner, meaning that a few important matters particularly financial probity, good governance,

and the full online and offline public self-disclosure of all finances, audits, procedures, infrastructure, faculty/staff, courses, and educational outcomes will be very effectively regulated. This information will have to be made available and kept updated and accurate by all higher education institutions on a public website maintained by NHERC and on the institutions' websites. Any complaints or grievances from stakeholders and others arising out of the information placed in public domain shall be adjudicated by NHERC.

- The fourth vertical of HECI will be the General Education Council (GEC). NCTE will act as Professional Standard Setting Bodies (PSSBs) under GEC along with other Professional councils like Indian Council for Agricultural Research (ICAR), Veterinary Council of India (VCI), Council of Architecture (CoA), National Council for Vocational Education and Training (NCVET) etc. These bodies, after restructuring as PSSBs, will continue to draw the curricula, lay down academic standards and coordinate between teaching, research and extension of their domain/discipline, as members of the GEC.

Improving teacher education is at the core of improving education in India and that needs a full scale, sustained, well resourced, grounds-up redesigning of the sector. The recommendations attempted in the paper may provide desired pathways for overall transformation of the teacher education sector. *Guru dev Rabindranath Tagore* once said, *'A teacher can never truly teach unless he is still learning himself. A lamp can never light another lamp unless it continues to burn its own flame'*. India has been waiting for such 'lamp teachers' since long. Therefore, this long wait of Teacher Education reforms must be over soon…

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Democratic Deficit and the Digital Deluge

Niraja Gopal Jayal, Professor, Centre for the Study of Law and Governance, Jawaharlal Nehru University, New Delhi delivered the Convocation Address through virtual mode at the 28th Annual Convocation of National Law School of India University, Bengaluru, Karnataka on September 27, 2020. She said, "Social media bring much joy into our lives, but we need also to be alert to the fact that they take control over some aspects of our identities. As citizens, but also as lawyers who will be in the frontline of determining how the law can protect our rights over personal and non-personal data, and negotiating issues of privacy and consent, I encourage you to be mindful of some of these traps." Excerpts

It is a singular privilege to participate in this 28th Convocation of the National Law School of India University, and a great pleasure to join you in congratulating the graduates and their parents. An exciting future awaits you, even though the world has been quite dramatically transformed between the time you came to law school five years ago, and today. This morning, I would like to draw your attention to some challenges of the post-Covid world and to suggest how you, the most gifted members of Generation Z, might steer us through it.

Even in our highly networked times, the name of the first casualty of the coronavirus pandemic is not known. It could be argued that its first identifiable casualty was globalization, as we knew it. This was already prefigured in the backlash to globalisation in the past few years, with the rise of economic nationalism, trade wars and protectionism, and anti-immigrant sentiment. The pandemic brought these to breaking-point. Supply chains were disrupted as were the movement of capital, goods and people. With global air travel today plummeting to levels last seen in the 1970s, the pandemic has clearly compelled us to press the pause button on our carbon footprint, something that the pleadings of advocates of climate justice could not accomplish. As countries closed borders, people rushed across the globe seeking the safe refuge of home, the more vulnerable among them – like Indian workers in the Gulf – having to sacrifice months of wages as they rushed back.

But is globalization dead? Can or should it be dead? Or is it possible to re- imagine a newer and better form of globalization to replace it?

For globalization does not have to be about the exploitative offshoring of manufacture, or even only about the global integration of markets. A newer form of globalization, grounded in an acknowledgment of the necessary inter- dependence of nations, is not just possible but also necessary. Whether it is the immediate imperative of a vaccine or the longer-term imperative of forging coalitions to combat climate change, a more humane and equitable form of globalization needs to be crafted.

Already, in the Anglo-American world, moral and political philosophers and lawyers have collaborated with medical experts to develop an ethical framework called the Fair Priority Model for a just and equitable global allocation of the vaccine, as and when it comes. If such a principle of fairness could be adopted by the international community (and obviously I have few illusions here) this would arguably be the first time in human history that principles of distributive justice were honestly applied across national boundaries, without regard to the power or wealth of nation-states.

Today, I wish to speak to you on two particular global phenomena of the contemporary moment, both of which are also abundantly manifest in India, and will significantly inflect the future that you will be called upon to negotiate. These are the Democratic Deficit and the Digital Deluge. Both were present in pre-pandemic times, but both have come into sharper relief since the pandemic began. If the first has been a victim of the pandemic, the second has been its beneficiary. While they are obviously quite different from each other, they are also, I will argue, not entirely unrelated.

Let me start with The Democratic Deficit. The erosion of democracy worldwide was already a notable phenomenon before the arrival of the pandemic. The *Democracy Report 2020* shows a surge in autocratization across the world. For the first time since 2001, autocracies are in a majority: 92 countries, home to 54 per cent of the global population.

India sadly does not buck the global trend. In 2017, it was described as a liberal democracy; today, it is classified as an electoral democracy. The difference is not insubstantial: a liberal democracy provides for

the protection of individual and minority rights and does this through constitutional protections for civil liberties, strong rule of law, and effective checks and balances that place limits on the use of executive power. An electoral democracy provides only periodic competitive elections. India, according to this report, has declined from a liberal democracy to an electoral democracy. This interpretation is complemented by our falling ranking on several other Indexes: to mention just a few, the Rule of Law Index, the World Press Freedom Index, the Academic Freedom Index, and the Social Progress Index.

Globally, as in our country, this unprecedented process of autocratization is characterised by a concentration of executive power that blurs the lines that we presume to be defining the separation of powers; an erosion of the core democratic principles of representation, accountability and transparency; and a blithe unconcern for the principles of legitimate governance. The absence of debate and deliberation on contentious issues in Parliament and the jettisoning of basic procedures of accountability means that laws can be made, not in accordance with the will of the people and their elected representatives, but by the will of the executive; that governments owe their citizens neither information nor explanation; and that citizens are effectively dispossessed of political agency till the next election comes around in four or five years, as the power can be relied upon to carry it to its pre-determined conclusion.

Democracy, in sum, is reduced to an elective mechanism that begets governments that are committed not to the welfare of all citizens, only to its supporters among them. The claim to govern legitimately does not acknowledge the need to be responsive or accountable to citizens in the conduct of governance. This effectively means that the rights and liberties of all citizens will not receive the equal protection of the law, only those of favoured groups will; and that the rights of minorities and other disadvantaged groups, even if guaranteed by the law, will be disregarded with impunity. These are just a few of the multiple ways in which democracy – in procedure, in practice and in spirit – has been diminished in recent times.

As the political theorist David Runciman says, coronavirus has not so much suspended politics as it has revealed the nature of state power. Just a few days ago, Lady Hale, the former President of the UK Supreme Court, said that the UK Parliament had "surrendered" its role over emergency laws that were curbing freedoms, by giving sweeping powers to the government, and imposing draconian health regulations on the public with no parliamentary scrutiny. The application of the National Disaster Management Act with no end-date, and without any provisions for review of the exercise of enhanced executive powers, is not dissimilar. The silence around multiple aspects of the pandemic, from data on the spread of the disease to the migrant workers' crisis, has been resounding.

I mention these deficits of democracy because, as members of the legal profession, you will be called upon to engage with them. I urge you to never forget that you are among the sentinels of our republic and the protectors of its democratic fabric.

I turn now to the second issue I wish to discuss with you, The Digital Deluge.

The pandemic has, as we know only too well, caused real life to be transposed and projected on to screens. For the past few months, we have effectively been living online. For lawyers and judges, doctors and patients, teachers and students: the professional world of work has come to be conducted on the internet. Outside of work, too, life is being lived online - recreation, entertainment, grocery shopping, social interaction. The wonder of technology has us in thrall for the ways in which it has made our virus-induced incarceration bearable. What the Polish philosopher Zygmunt Bauman memorably called

Liquid Modernity can now be renamed Liquid Crystal Display or LCD Modernity.

And yet, I have no doubt that a virtual convocation would not have been your preferred mode of celebrating this very special day. You would much rather have been on campus dressed in your academic gowns and mortar-boards, in the company of your teachers, and the friends with whom you forged enduring friendships. Instead, you find yourselves in front of a screen, by all reckoning a sorry substitute.

The digital now envelops our lives and world in a quite unprecedented way. Even before the pandemic, much had been said about the interface of the digital media and politics across the world. We learnt, if distantly, of the power of the digital media to interfere in elections in different countries. At the same time, we celebrated what appeared to be the inherently democratizing quality of the social media – where every opinion could find a voice, or at least a tweet.

Social media bring much joy into our lives, but we need also to be alert to the fact that they take control over some aspects of our identities. As citizens, but also as lawyers who will be in the frontline of determining how the law can protect our rights over personal and non-personal data, and negotiating issues of privacy and consent, I encourage you to be mindful of some of these traps.

The philosopher Hannah Arendt taught us that the essence of politics, especially democratic politics, lies in the clash of opinions, which are formed through debate in a public sphere, a space in which all are political equals, in which individuals can form opinions freely, express them freely and test them in and through public debate. This may seem impossible when propaganda is used to make lies appear as true, exploiting the vulnerabilities and the anxieties of people. Yet, it is the only way, said Arendt, to deal with the contest between truth and lies in politics.

In recent years, Twitter came to be valorised as a virtual public sphere, an *agora*– the open space in the cities of ancient Greece where citizens would debate on what constitutes the common good. In our times, the digital agora has found expression in a pioneering experiment in what is called 'radical transparency' initiated by the famous Digital Minister of Taiwan, Audrey Tang. This entails using an online forum crowdsourcing public opinion for policy-making. On contentious subjects, people are invited to give suggestions, others respond and over a few weeks of online dialogue, a series of policy recommendations emerges. 'Civic tech,' as it is called, thus forges an innovative relationship between the state and civil society.

A digital agora is clearly not a feasible model for a country like ours. At the most banal level, the lockdown showed how, even on the micro scale of the WhatsApp groups of Residents' Welfare Associations, we struggled to have calm and reasoned debates on defining common goals by consensus.

Nevertheless, three aspects of the digital media and its enhanced presence in our lives demand our attention: technology and state power; technology and democracy; and digital inequality.

(a) The first is the contemporary iteration of the age-old question about the relationship between technology and state power. Technology can enhance state power in obvious ways, through the incredible possibilities for state stored on government servers that seem to be always hungry for more.

Justice B.N. Srikrishna, who headed the committee that drafted the Personal Data Protection Bill has described the version of the bill that is currently pending enactment as dangerous, because it gives sweeping powers to an Orwellian state, thus endangering the privacy of citizens whose personal data is not adequately safeguarded. There are legitimate anxieties about the enhanced possibilities for state surveillance, even when these are justified by benign purposes such as welfare interventions or, most recently, access to health facilities.

As the cliché goes, data is the new oil: the source of enormous economic value for companies and enhanced power for states.

(b) Secondly, the digital media today offer enormous opportunities for what used to be called propaganda, with the possible difference that propaganda was easier to identify than the sophisticated and subtle world of political messaging today, conveyed through ostensibly non-political platforms of social networking. The amplification of political opinion in a calculatedly one-sided way precludes the possibility of dialogue and deliberation, as it repeatedly, on the basis of your own viewing history, shows you what you need to believe and furnishes you with evidence as to why you should believe it. Psychologists tell us (as does the documentary *The Social Dilemma*) that the effect of social media on the brain is to provide a dopamine stimulant, so that the brain chemistry of social media addicts and drug addicts isn't all that different. We could be deluded into thinking that our opinions are uniquely our own, arrived at by the exercise of our own rationality, though they are actually the result of our having been programmed, with our own unconscious complicity, in particular ways.

When political actors use these sophisticated tools to burnish and instrumentalise echo chambers, the citizenry has been moulded, in ways that we do not recognise as propaganda even if that is what it is. The insidious consequences of these processes for democracy are not limited to how people vote. It has serious consequences also for social harmony, such as when particular social groups are projected as objects of hate deserving of violent speech and action.

Even science is rendered manipulable. It was reasonable to expect that the pandemic would have the effect of making the global public more receptive to science and to expert knowledge. Instead, we have governmental attempts to exercise control over the scientific establishment, to prevent transparency and information-sharing with citizens around the coronavirus statistics. Populist leaders, who first inculcated a skepticism about scientific expertise, now encourage vaccine nationalism, to the detriment of poorer countries.

(c) The flip side of the Digital Deluge is something that is often called the Digital Divide, but should actually be known by its proper name–Digital Inequality – because it mirrors and reproduces other forms of inequality in our society. The commonplace form of this of course is the inequality of digital access in the obsession with digital teaching, learning and examinations.

But the absence of access is only the most obvious way in which digital inequality is created. Experts have already begun to flag concerns about algorithmic bias – based on gender, religion and caste – with artificial intelligence magnifying such bias in a range of areas from the grant of loans and recruitment, to law enforcement and the judiciary.

In India, social media have allowed the doxing of inter-faith couples who applied for registering their marriages, so that hundreds of them found their private information displayed on Twitter and circulating on WhatsApp with hateful comments. Twitter has just taken these down after two months.

Conclusion

Many of the dimensions of the democratic deficit and the digital deluge that I have discussed entail some loss of human agency: civic agency, political agency and, most of all, moral agency. Speaking of moral agency, I would like to applaud the Alumni of this great institution for their public-spirited generosity in getting planeloads of migrant workers safely home.

In the post-Covid world, it will be imperative to recover and reclaim agency. This will admittedly not be easy given that we are today seeing change on a scale that none of us has ever witnessed. At least as a philosophical principle, contradictory as it may sound, we all know that change is a constant. As the Greek philosopher Heraclitus famously said, you never step into the same river twice.

However, when change is combined with fear, risk and uncertainty, we find ourselves struggling to make sense of it and floundering in our response to it. This is not just a new version of the 'risk society' that sociologists spoke about in the 1980s. Today's risk has a universal quality – almost no corner of the globe is untouched by it. It has also triggered a universalization of fear – an almost primal fear of the stranger and of physical touch in a way that is disturbingly reminiscent of the dastardly practice of untouchability in caste society. But we must hope that the shared and collective quality of this fear will enable empathy, social cooperation and solidarity in ways that have been manifestly fraying of late. This will be essential to the task of redesigning a new and more humane social contract in which there is equitable provision of basic needs, including health and education.

Your generation has learnt valuable lessons that mine (unless they were game theorists) did not have the opportunity to learn – how to negotiate uncertainty, and how to make choices under conditions that are unpredictable. These are lessons that will surely stand you in good stead in a post-Covid world.

As you advance in your careers, I hope your work will always be animated by the noble goal of upholding and strengthening the rule of law; and that the temptations of technical sophistry and clever casuistry will never deter you from ensuring that law works in the service of justice – in its most profound and meaningful sense – especially for the most vulnerable. This country asks you for nothing less, and I am very confident that you will give us your best.

Thank you very much.

STUDENT COLUMN

Exploring Ecofeminism in Ramante Edanthottam

Pearl Josey*

Ecofeminism is a movement that emerged in the mid-1970s alongside second-wave feminism and the green movement. It relates the exploitation and degradation of the natural world with the subordination and oppression of women. The actual term ecofeminism goes back to the French Feminist Françoise d'Eaubonne (1920-2005), who introduced it in 1974. Ecofeminist thinkers draw on the concept of gender to analyse the relationships between humans and the natural world. It perceives woman as being analogous to nature. It identifies woman with earth and the exploitation of the natural resources can be compared to the rage of males on the brilliant and persuasive forms of the beauty of creation. While comparing and contrasting the elements of the feminist and green movements, ecofeminism offers a challenge to both. It brings to light the inhuman activities on the non-human world (Peterson). In Indian Philosophy also the Female is Associated with *Prakriti* and Male is *Purush*.

Ecofeminism attempts to coalesce ecology and feminism. This movement holds that both women and nature must be respected. Ecofeminism is also an academic discipline. Ecofeminist analysis parallels between the oppression of nature and the oppression of women. The natural world encompasses all living and non-living creations of God; the birds, the rivers, the butterflies, the lilies, the roses, the oyster, the pearl and the list goes on. Many a times, it is the woman who caresses nature and tends it. In great literary works for children, that are mostly all time classics, female characters can be seen as nurturing the nature. My statement can be justified by citing a few examples like: Goldilocks goes to the home of the three bears, Little Red Riding Hood converses with the wolf, Dorothy befriends lion , Snow White talks to the birds, Cinderella with mice and her allies, the Mermaid who is half fish, Thumbelina courted a mole etc. (Griffin, prologue)

Ecofeminism has been portryed in popular movies like FernGully and Moana. In mollywood, Ramante Edanthottam is an example of an ecofeministic portrayal.

Ramante Edanthottam is a 2017 Indian malayalam-language romantic drama film written, produced and directed by Ranjith Sankar. The film stars Kunchako Boban in the title role.

The movie starts with Malini taking a video message of herself to send to Raman while driving, telling that she is coming this year to visit the Edanthottam. Unfortunately, she meets with an accident. At the hospital, her husband Elvis discovers Malini is having a love affair with Raman from her phone. The film gives a flashback to the year before, when Elvis, Malini, their 10 year old daughter and their family friend Salim and family go to Edanthottam in Vagamon to cheer up Elvis (who is a desperate producer trying to make his comeback to the movie industry).

Malini is frequently insulted and looked down upon by Elvis who in contrast is a good father but a hideous husband. There, Malini meets the owner of the Edanthottam, Raman. She becomes friends with Raman who is a widower (and his wife's name was also Malini). They spend time together talking about their life, past, future and gels up so much that at one point they get an intuition of finding the perfect match for them. Even though Malini has a bad married life, she still respects the relationship she has with her husband and daughter, and keeps a friendship with Raman. On the other hand, Raman who was intensely in love with his late wife finds traces of her in Malini. He still keeps his relationship as a friend. They share their thoughts about each other's career. Malini being a graceful dancer, Raman advises her to start a dance school. And also invites her to come to his resort next year. Malini starts a dance school with Elvis's reluctant approval which was a success. As Elvis is a lazy, not so serious type person who is not dedicated to his work gets huge debts which make them change their home once in a while. Since Malini starts to earn from the dance school, she looks after the house and gets more confidence and voice in front of Elvis. Whereas Elvis is depicted as a cheating husband who goes to prostitutes while he is out of town for work.

Next year, Malini approaches Elvis about Raman's invitation to Edanthottam. Elvis agrees, but a change in schedule makes him go to Chennai. Malini quietly goes to Edanthottam alone where she and Raman fall in the verge of love. But it is shown that they respect their personalities and decides to remain good friends. In present day, Malini recovers, and is questioned by an enraged Elvis. Malini leaves the house and sends Elvis a divorce notice which shows her being an independent

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woman. The movie ends with Malini driving a car to drop Raman to the airport. It is shown that they are still continuing with their friendship. It is also shown that the divorce is approved and their daughter is living with each parents separately each month. (Ramante Edanthottam)

This romantic drama tries to capture the complexities of life. The setting of the movie revolves around a resort spread over 500 acres. The resort is located at a remote place where there is no internet connectivity and no mobile networks.

In this movie nature is not tortured or ill-treated, but on the other hand is projected with all its beauty. The movie is able to evoke a love for nature and also succeeds as a call for afforestation. It highlights the mirth and satisfaction one receives through his/ her union with nature. A walk with nature always refreshes our mind and body. A great example of this is seen when Malini after her visit at the resort amid the forest, reappears as a strong independent woman unlike the former Malini who was very timid and all enduring subservient girl. Just as another encourages her child to be bold, here the mother nature has inspired Malini to stand for herself. In this movie, Raman who is shown as the protector and supporter of nature can be seen as the symbol of nature. That is, he himself becomes the nature. He plays a very important role in cheering up Malini from her hushed up state. He plays just the opposite role of Elvis, Malini's husband.

Viewing from a feminist point of view, women are equally capable of anything as men are. They should be given equal rights and opportunities. Malini, who should also enjoy the same privileges and status as the men is not given a chance. She is deprived of all the happiness till the middle of the movie. She was locked in a typical patriarchal family set-up. Though she wanted to scream out she kept silent. She did everything possible to save their marital relationship. She was a good mother and a responsible wife. But no matter how hard she tried, she could never enter into the good books of Elvis. She was not given any value or respect.

In the eyes of Elvis, women were merely objects. For him, they were just a piece of entertainment. He was never ready to be known by his wife's name. Though Elvis never succeeded in running a financially stable house by his own, and therefore seeked Malini's aid, he was always reluctant to acknowledge it. It is Malini who pays off the home loan, school donation fee and even Elvis's club fund. Elvis gets raged when a club staff remarks that Elvis lives with his wife's money. Though Malini is very clearly aware of the fact that she is not going to get any recognition from Elvis, she was always happily ready to provide for his needs. She lost her own self-respect. Her condition was a bit better than a slave.

But the table gets turned from the last quater of the movie. A new Malini appears on the stage. A revived strength reflects all her actions and dialogues. She became bold enough to stand alone and fight. She no longer allows her to be harrassed. It is when Elvis waits for Malini to come and confess her mistakes to him and expects her to be silent and obedient as before; he gets the greatest shock of his life, the divorce notice. This was an unexpected move from the part of Malini. Now the game is open for Malini and it is her time to play.

Her adamant stand shakes his confidence and makes chauvinism in him to the extent that he approaches her with their daughter seeking a compromise. He suggests that she be the old obedient and submissive Malini once again. As a reply, she tries to draw his attention to the last twelve years when she had put away all her desires and dreams for his happiness and for the smooth sailing of the family. The feminist in her renounces her wish to live a life with Elvis anymore. In this negotiating conversation between the duo, she justifies her decision to proceed with the divorce notice. By staying that as for Adi, their daughter, the two being separated would be better than modelling an unhealthy family atmosphere for the growing child. She voices the unheard and uncared desires which she needs to nurture and which were never his concern.

This is a moment analogous to the times when earth fights back, roars in rage to the continuous misuse of the natural resources, to the relentless exploitation by man. The revenge of nature takes dreaded forms like floods, earthquakes, contagious viral attacks, droughts, hurricanes, cyclones etc. The disrespectful misogynist in Elvis experiences a presaging disaster as if a tsunami had hit his whole self. Just as a branch of a tree grows towards the direction where it gets sunlight which is necessary for its existence, Malini also shows interest in Raman as it is in him that she finds acceptance and gets respect.

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COMMUNICATION

Tributes to Dr. A.P.J. Abdul Kalam[#]

Sumita Rai*

A great person is always the very person who is able to conquer the time through the ages, even when he is no more. Such a person never quits us. Because, when he quits, only the corporeal part of him dies. A great person always puts forward the rectified needs of others in front of them, being always the inspirations and instances. Being similar in contemplation, the great person and humanitarian, Dr. Avul Pakir Jainulabdeen (A.P.J.) Abdul Kalam will always remain immortal among us.

An Enlightened Life

Kalam was born on 15 October1931 and brought up in Rameshwaram, Tamil Nadu. He went to Rameshwaram Elementary School, then to Schwartz High School, Ramanathapuram. He completed graduation in science from St. Joseph's College, Trichy (Tiruchirappalli). He then studied aeronautical engineering at Madras Institute of Technology. He spent the next four decades as a scientist and science administrator, mainly at the Defence Research and Development Organisation (hereinafter DRDO), Delhi; and Indian Space Research Organisation (hereinafter ISRO), Bangalore; and was intimately involved in India's civilian space programme and military missile development efforts. He wanted self reliant India in space science, ballistics and nuclear power. A humble boat owner's son who had overcome penury and became the first one to secure a position at the top of the scientific hierarchy and contributed substantially. He had been afterwards nominated to the nation's highest office and became the most popular President of India. The period of his Post-Presidency life was also philosophically glorious, being an inspiration for the younger generation in activities. Passing away of Kalam on 27 July 2015 had sensibly generated love, respect and regards from the all sects of people. All these resulted in overflowing homage.

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** Published to commemorate birth day of Dr A P.J Abdul Kalam, former President of India.*

Scientist and Technocrat

Kalam's hope of becoming a fighter pilot was dashed when he had narrowly missed out from such recruitment in Indian Air Force. He instead joined DRDO, as a Senior Scientific Assistant in 1958. Since then Kalam spent decades being engaged in India's strategic programmes allied to space, missiles and nuclear weapons. After moving to the newly formed ISRO in 1969, he was designated as the Project Director for launching of SLV-III (Three-stage Satellite Launch Vehicle). The first flight of SLV-III failed on 10 August 1979, but the second flight, 11 months latter on 18 July 1980, was a grand success. The launching of the satellite from Sriharikota, Andhra Pradesh brought his recognition in spectacular career as a rocket engineer and missile technologist. The SLV-III had successfully placed the Rohini satellite in near earth orbit and consequently made India a member of the exclusive Space Club.

He came again back to DRDO as Director in 1982 in order to lead the guided missile development programmes. India's rocketry and missile programmes thereafter took great strides under his supervision. He was, to a great extent, praiseworthy for making India missile power and giving Indian defence forces formidable weaponry for developing its defence arsenal by producing missiles like Agni, Prithvi, Akash, Trishul and Nag. He became the Senior Scientific Adviser to India's Defence Minister in 1992. When I. K. Gujral became the Prime Minister, he admired Kalam's work and austere lifestyle and thereafter referred to him as the '*Sadhu* of Indian Science'. It was Gujral's government that bestowed on Kalam the nation's highest award, the Bharat Ratna in1997. He co-ordinated and played a key role in May 1998 in Pokhran-II tests, in which five nuclear devices were detonated in Rajasthan Desert. The nuclear tests were held during the tenure of the Prime Minister Atal Bihari Vajpayee led National Democratic Alliance (hereinafter NDA) government. The bombs were developed by the scientists at Bhabha Atomic Research Centre (BARC), Mumbai, and

DRDO. Kalam's contribution, during his tenures, at DRDO and ISRO had considerably inspired younger scientists and technocrats in our country.

People's President

In 2002 India's ruling NDA government put forward Kalam to succeed outgoing President Kocheril Raman Narayanan. The main opposition party, the Indian National Congress, also proposed his candidacy. Kalam had easily won the election and became the India's 11th President from 25 July 2002 to 25 July 2007. He consequently earned the sobriquet of being the 'People's President', due to his humility, accessibility, personality and moral principles. All this made him a true Indian icon. He was the first scientist and the first bachelor person to occupy Rashtrapati Bhawan. In the five years of his occupancy, Kalam did or said nothing which could be regarded as contentious. He played with straight bat. On few occasions he was called upon to exercise his independent judgment. He returned the Office of Profit Bill or Parliament (Prevention of Disqualification) Amendment Bill 2006 to both the Houses, Rajya Sabha and Lok Sabha, without signing. That was a major decision. He had studied the bill and returned it for reconsideration. The situation created its own dynamic. Then when approach for the second time, he signed the bill on 18 August 2006. He had otherwise acted with copybook propriety. He had equal dealings with the Congress President Sonia Gandhi and the then Prime Minister Manmohan Singh, up to the end of his tenure. In 2007, Kalam was succeeded by Pratibha Patil, the country's first woman president.

Post-Presidency Days

After leaving the Office, Kalam became a Visiting Professor of several institutes like Indian Institute of Management (Shillong); Indian Institute of Management (Ahmedabad); and Indian Institute of Management (Indore). He then also used to hold other positions like Honorary Fellow of Indian Institute of Science (Bangalore); Chancellor of the Indian Institute of Space Science and Technology (Thiruvananthapuram); Professor of Aerospace Engineering at Anna University (Chennai); and similar glorious adjuncts at many other academic and research institutions across India. He taught information technology at the International Institute of Information Technology (Hyderabad) and some aspects of technology at Banaras Hindu University (Varanasi). He used to always nourish a dream on extending all the modern facilities to rural communities. Such a tender humanitarian approach to patriotism and nationalism made him an offbeat figure for one and all people in our country.

Following a heart attack during a lecture in Shillong's Indian Institute of Management (IIM), generated an outpouring of respect from citizens. Crowds of people flocked to pay him their last respects and obituaries happened to a flooded situation in all the leading newspapers, magazines, journals and social media. On 27 July 2015, Kalam was in Shillong to deliver a series of lectures at the IIM. The title of the lecture was 'Creating a liveable earth', resembling a short course for the students. But he collapsed in the midst of lecture. Therefore, he could not complete rest of the lecture. Till the last day of his life, he was a persistent publicist of education, innovation and development.

Reminiscences of his Extraordinary Personality

Kalam was an ordinary man with extraordinary personality. His simplicity, sensibility, humility, honesty and austere lifestyle had magnetic attraction to win over people. It was the greatness of Kalam that he was such a sensible person in dealing with fellowmen whether a higher officer or subordinate staff or common citizen.

He used to inculcate ideas how to solve India's problems on bridging the rural-urban divide through his pet concept of PURA or 'Providing Urban amenities in Rural Areas' for empowering villages, and also to use solar power in a big way to tide over India's energy needs. He donated all of his earnings to PURA (Providing Urban amenities to Rural Areas) and different charitable funds.

Teachers and employees of Visva-Bharati remembered how, in October 2004, the then President of India had met one Group D staff and interacted with them freely without minding the protocol. Former Lok Sabha Speaker Somnath Chatterjee remembered an incident that Kalam, at the centenary celebration of the Mitra Institution, Kolkata had broken the protocol and approached students to interact. He used to love children and students the most. He used to personally interact with MPs of different states to know the problems in their areas as well.

Notable books authored by him include: Wings of Fire (autobiography); India 2020-A Vision for the

New Millennium; Ignited Minds; My Journey; The Luminous Sparks (a biography in verse and colours); Children ask Kalam; and so many books.

On being asked why he never got married, Kalam answered with a smile, "We had a huge family, so one of us could afford not to have children. I decided to become the *brahmachari*!" His life was an extraordinary narrative of astonishing facts. Kalam had no personal property when he died. He didn't even have a refrigerator or air conditioner. His only possessions were a wrist watch, six shirts, four trousers, three suits, a pair of shoes and as many as 2,500 books.

Tributes from the President, Prime Minister and Parliament

Mr. Pranab Mukherjee, the then President of India, described him as the most loved by the country's people and children after *Pandit* Nehru. He said, "Dr. Kalam was always jovial and carried his years lightly. His mind was ever agile. He was humble but had a mighty mind. He was the People's President and will continue to remain so in the hearts of people after his demise". He further added, "Our friendship developed because we had a common passion i.e. books. He loved books and lived amongst them. His world revolved around books... This passion brought us together".

Shri Narendra Modi, Hon'ble Prime Minister of India, described Kalam as a '*Rashtraratna*' and an "Ordinary man with an extraordinary personality" who gave the best to every position he held.

Parliament paid glowing tributes to former President Kalam, hailing him as India's 'true son' and 'real gem' whose contributions would be deeply cherished by the grateful nation. The Lok Sabha Speaker Smt. Sumitra Mahajan read out the Parliament's condolence resolution: "In Dr. Kalam's death, the country has lost a sagacious statesman, a great scientist and a friend of the under-privileged, and a fine human being".

Dr. Manmohan Singh, who had served as Prime Minister under Kalam, said, "Our country has lost a great human being who made phenomenal contributions to the promotion of self reliance in defence technologies. I worked very closely with Dr. Kalam as Prime Minister and I greatly benefited from his advice as President of our country. His life and work will be remembered for generations to come".

Notable Tributes Abroad

United States President Barack Obama extended "Deepest condolences to the people of India on the passing of former Indian President Dr. A.P.J. Abdul Kalam", and highlighted his achievements as a scientist and as a statesman, notably his role in strengthening US–India relations and increasing space co-operation between the two nations.

Russian President Mr. Vladimir Putin expressed sincere condolences and conveyed his sympathy, "To the near and dear ones of the deceased leader, to the government, and entire people of India".

Secretary-General of the United Nations Mr. Ki-Moon visited the Permanent Mission of India to the UN and signed a condolence book. "The outpouring of grief around the world is a testament of the respect and inspiration he has garnered during and after his presidency. The UN joins the people of India in sending our deepest condolences for this great statesman. May he rest in peace and eternity"

Tributes from his Colleagues

Kalam's colleague in DRDL (Defence Research and Development Laboratory), Ranga Rao remarked: "You didn't feel he was some kind of a boss. He was a person who had already arrived". Kalam was therefore regarded as a father figure. His style was never confrontational and he had vast reserves of patience. Kalam always worked towards building a consensus rather than ramming down decisions.

Anand Parthasarathy, a Former Scientist who worked with Kalam in Indian Missile Programme wrote: "Strength respects strength". This was Kalam's usual response to the question why India needed its own missiles or a battle tank or a combat aircraft. He was the happiest person at the drawing board, in discussion with his scientists, insisting how their dreams for the next millennium could be fulfilled.

Dr. K. Rama Rao, retired Associate Director, DRDL and DRDO, who was former President's room-mate in college and close colleague for 15 years stated "During admissions session at the Madras Institute of Technology (MIT), 1954 we had to pay Rs.1000 as fee. We were all excited but Kalam was calm and said his sister had mortgaged her bangles to let him study aeronautical engineering".

ISRO Chairman A S Kiran Kumar recalled his former colleague, "A great Personality and a gentleman".

Tributes from Notable Personalities

Dr. Shashi Tharoor, the then elected Member of Parliament, former Minister of State for External Affairs, former Under-Secretary General of the United Nations and a prize winning author wrote: "Dr. Kalam's popularity was undimmed by his relinquishment of office. On retirement he set for himself a demanding schedule of speeches, notably to educational institutions, and had an uncanny ability to connect with a variety of audiences". Dr. Shashi Tharoor wrote there further: "In his simplicity lay the secret of his ability to connect with people, across the boundaries of age, class, religion and region. In his life and work, Dr. Kalam embodied the best of what India can be".

Shri Srijan Pal Singh who was the Advisor and Officer on Special Duty to Kalam from 2009 to 2015 wrote on 30th July2015: "To me the line which separated Dr. Kalam from the rest was not just his knowledge. It was his sensitivity and humility. He always introduced everybody as friend whether it be his secretaries, his driver, his gardener, his cook or the people who maintained his house or even a stranger he just met. To him the world was truly flat and there was no place for hierarchies and ranks in his life. He had the gift of empathy–and his memory of other people's difficulties was impeccable. That was his art of winning over people. If he saw anyone with even a small cold on a day, he would offer medicine or hot soup. The next day his first words would be -Are you repaired?"

Shri Shekhar Gupta, an Indian Journalist and Author, in his article 'Everything that Dr. Kalam Was Not, and Yet Why a billion-plus Indians hail Him as Their Most loved Leader in Decades' wrote: "He came to be hailed among our greatest scientists ever, in the class of C.V. Raman and Jagadish Chandra Bose, way above his mentors' generation of Homi Bhabha and Vikram Sarabhai or his peers in DAE, ISRO and DRDO. He is immortalised in our collective memory as the man who gave us our nuclear deterrent".

Important awards and honours

Kalam received honorary doctorates from many universities. The Government of India honoured him with the Padma Bhushan in 1981 and the Padma Vibhushan in 1990 for his work with ISRO and DRDO and his role as a Sientific Advisor to the Government. In 1997, Kalam received India's highest civilian honour, the Bharat Ratna, for his contribution to the scientific research and modernization of defence technology in India. In 2013, he was the recipient of the Von Braun Award from the National Space Society, to recognize his excellence in the management and leadership of a space-related project. Some of the other important awards and honours which he was awarded in timeline were: Ramanujan Award 2000, King Charles-II Medal 2007, Hoover Medal 2009, IEEE Honorary Membership 2011, DSc Edinburgh University 2014.

Commemorative Efforts

Following his death, Kalam received numerous tributes. Such tributes were spontaneously initiated, in quite a good number of occasions and in diverse deliberations and manifestations, throughout the whole country.

- The 'Dr. A.P.J. Abdul Kalam National Memorial' was built by the DRDO in Pei Karumbu, the island town of Rameswaram, Tamil Nadu. It was inaugurated by our Hon'ble Prime Minister Narendra Modi in July 2017.
- The Tamil Nadu State Government announced that his birthday 15th October would be observed across the state as 'Youth Renaissance Day'.
- The Tamil Nadu State Government further instituted 'Dr. A.P.J. Abdul Kalam Award', comprised of an eight-gram gold medal, a certificate and Rs.500000 (US$7000). It has been awarded annually on Independence Day since 2015, to the recognized residents of the state with achievements in promoting science, humanities or the welfare of students.
- Hon'ble Prime Minister Narendra Modi ceremonially released postage stamps commemorating Kalam at DRDO Bhawan, New Delhi, on 15 October 2015.
- Researchers at the NASA Jet Propulsion Laboratory (JPL) had discovered a new bacterium on the filters of the International Space Station (ISS) and named it *Solibacillus Kalamii*, to honour the late President Dr. A.P.J. Abdul Kalam.
- An agricultural college at Kishanganj, Bihar, was renamed as 'Dr. Kalam Agricultural College' by

the Bihar State Government, on the day of Kalam's funeral.

- India's first medical technology institute was named as 'Kalam Institute of Health Technology', at Visakhapatnam.
- Uttar Pradesh Technical University (UPTU) was renamed 'A.P.J. Abdul Kalam Technical University' by the Uttar Pradesh State Government.
- Kerala Technological University, headquartered at Thiruvananthapuram where Kalam lived for years, was renamed to 'A.P.J. Abdul Kalam Technological University' after his death.
- 'Dr. A.P.J. Abdul Kalam Planetarium' in Burla, Sambalpur, Odisha was named after him.
- The Wheeler Island, a national missile test site in Odisha, was renamed 'Abdul Kalam Island' in September 2015.
- A prominent road in New Delhi was renamed from Aurangzeb Road to 'Dr. A.P.J. Abdul Kalam Road' in August 2015.
- In February 2018, the scientists of the Botanical Survey of India named a newly found plant species as *Drypetes kalamii*, to honour him.
- Construction of 'Dr. A.P.J Abdul Kalam Science City' was initiated in Patna in February 2019.

Conclusion

Kalam faced an interview at the 12th Wharton India Economic Forum 2008, held at Philadelphia where there were galaxy of speakers. He then enumerated five traits that a leader, especially the President of India must possess. "The leader must have vision. Without vision, you cannot be a leader. Second, the leader must be able to travel into an unexplored path. Normally the tendency is for people to travel along well-laid out ways. Third, the leader must know how to manage success, and even more importantly, failure. The fourth trait is that the leader should have the courage to make decisions. Fifth, the leader should have nobility in management. Every action of the leader should be transparent. And finally, the leader should work with integrity and succeed with integrity".

He continued to be a popular public figure even years after demitting the office. He was an inspiration for the youth. His active and visible presence in social media provided a unique opportunity to engage with his readers. He travelled across the country for several teaching assignments at IITs and IIMs. On different occasions, he used to interact with students and people from all walks of life.

Kalam is regarded as the role model of millions of youth in our country, fired by the ambitions of achieving greater things in life. His humility, simplicity, austerity, patriotism and honesty always impress us. He earned love and respect of the people of India cutting across castes, communities, regions and ages. He will continue to live among people and be remembered by the generations to come.

In stipulation of words, there have been impossibilities often to capture all the aspects of such a multi-dimensional personality. This is but a brief tribute to him on the occasions of his birthday may however feel free to remark, communicate and indicate any of the allied aspects at sumira. 0584 @ yahoo.com.

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Online Lecture Series on National Educational Policy—2020

A four-day Online Lecture Series on the theme 'National Educational Policy (NEP) —2020: A Path to Transforming Indian Education System' was organized by Maulana Azad National Urdu University (MANNU), College of Teacher Education, Bhopal, recently. The session was inaugurated by Registrar and Dean, School of Education and Training, Prof. Mahmood Mohd. Siddiqui and Presidential Address was delivered by Prof. S M Rahmatullah, Vice Chancellor, MANUU. The programme started with *Tilawat-e-Quran* followed by MANUU *Tarana*. Thereafter, Prof. Noushad Husain, Principal, CTE, Bhopal delivered his welcome address wherein he thanked the Vice Chancellor and Registrar for giving all kind of support for initiating the lecture series. He also briefed participants about objective behind starting an online lecture series. In the inaugural address, Registrar, MANUU highlighted the relevance of NPE—2020 and the key implications for higher education. Vice Chancellor, MANUU in his presidential address reiterated that the theme was quite apt in the present scenario as it would all together transforms the higher and school educational situation of India by 2035. Vote of Thanks was proposed by Dr Talmeez Fatma Naqvi, Coordinator of the event followed by National Anthem.

Prof. Mohd. Akthar Siddiqui, former Chairperson National Council for Teacher Education (and Dean, Faculty of Education, *Jamia* Millia Islamia, New Delhi expressed his views on the topic 'A Future Roadmap for Teacher Education in the Light of New Education Policy–2020'. He talked about growth and development of education in post Independence times. In respect to teacher education, he stressed DIET, SCERT, IASEs, CTEs, etc. have to play greater role in teacher education. He also showed his concern about the growing commercialization in teacher education. Therefore, he urged that for good professional development of teachers, focus on teacher education is key. He addressed several issues in teacher education like curricular and pedagogical issues, assessment, experiential learning, etc. which need immediate attention and necessary reforms for the success of NEP—2020. In view of Integrated Teacher Education Programme (ITEP), he suggested that environmental building process is required to successfully adopt the ITEP. Removing sub-standard teacher education institution, manpower planning, need based teacher education regulation rather norm based and finally dedicated teacher education programme, dedicated internship and dedicated practice school teaching infrastructure need special attention to successfully implement NEP—2020.

Resource Person, Prof. Rajesh Khambayat, Joint Director, PSSCIVE, Bhopal spoke on 'National Educational Policy—2020: Re-imagining of Vocational Education'. At the onset, he provided the background of vocational education in India. He briefed the audience about the present scenario of vocational education in India. He highlighted that in the NEP—2020 it has been mentioned that by 2025 at least 50 per cent of learners through school and higher education system shall have exposure to vocational education which can be achieved by introducing vocational education from class 6 onwards and integrating it with general education. He further highlighted that social sensitization about importance of vocational education will be achieved through social media and ICT. For this, awareness programmes would be organized to change the general perception and attitudes towards vocational education. He reiterated that NEP has the provision of mix and match academics with skill education, with sports, arts and with soft skills. For this collaboration of school with ITI, polytechnics would be done. He highlighted that for vocational education, career counseling and guidance would be provided to children from Classes 9 to 12 so that children can make career choice, based on their interest, aspiration and abilities. For this Skill Based Aptitude Test (SBAT) would be introduced by providing guidance to the students for making informed career choice. Innovation and entrepreneurship will be promoted in schools through problem based learning. He mentioned, in his talk that teachers are at the core of the change therefore, it is important that vocational teachers should be prepared. NCTE in consultation with Ministry of Education will work out the modalities of preparing vocational teachers. New methods of vocational training of teachers in NEP are Massive Open Online Courses (MOOC), Flipped Learning and Virtual Learning methods.

Prof. Furqan Qamar, former Secretary General, Association of Indian Universities, New Delhi and Professor, Centre for Management Studies, Jamia Millia Islamia, New Delhi talked about 'Holistic Higher Education'. He said that higher education should be holistic in nature to enable the citizens for facing the challenges of the world and ultimately to reach perfection. It can be achieved through structural changes in the courses of higher educational institutions and universities, initiative for starting multi disciplinary programs in universities, setting up of a single authority or agency for regulating various multi disciplinary higher education institutions and also through the modular and flexible nature of courses.

Dr. Manas Ranjan Panigrahi, Senior Programme Officer, CEMCA, New Delhi expressed his views on 'Technology Enabled Learning with Special Reference to National Education Policy—2020'. He highlighted that current GER of India (28 per cent) in higher education is low as compared to many developing countries of the world. He pointed out the up gradation of online platforms envisaged in the NEP will cater the shortage of GER by 2035. Drastic change needs from the part of all stakeholders with regards to purpose, way of using online platforms and resources to target the achievement. NEP focuses on lifelong learning through the means of online platforms. Technology enabled learning is the spinal cord of NPE. Therefore, ODL and OER had brought a paradigm shift in education world in this pandemic period and paved the way of technological interventions for reaching to the unreached. Dr. Indrajeet Dutta, Coordinator of the event proposed the Vote of Thanks with special thanks to Vice Chancellor, Registrar, Dean SE & T, Director, CIT and IMC, Principal, CTE, Bhopal, Resource Persons, Moderators of the sessions along with team of teaching and non-teaching staff of CTE Bhopal.

Online Faculty Development Programme

A One-week Online Faculty Development Programme on 'Life Skills for Educators' is being organized by Teaching Learning Centre, Indian Institute of Technology (Banaras Hindu University) Varanasi during November 02-06, 2020. The regular/ full-time faculty members at the level of Assistant Professor /Associate Professor in the disciplines of Arts, Science, Commerce, Engineering, Medical Sciences, Agricultural Sciences, Pharmacy, etc. in Government funded Universities/Institutes of Higher Education /Colleges may participate in the event. The aim of the programme is to introduce participants to a group of research skills, psychosocial and interpersonal skills, and digital skills in an experiential setting with a view to developing in them the requisite capacity for optimal performance. The core life skills included in the programme are essentially those skills that help to develop competence and to promote mental wellbeing among participants and to prepare them for the challenges of personal and professional life.

There is a growing awareness of the rapidly changing social, economic, and political structures among educators, Simultaneously, there is also a growing need to keep pace with demands and challenges caused by these transformations. Realising this need for sustainable up skilling, UNICEF, UNESCO and WHO have listed the ten core life skill strategies and techniques that need to be acquired by individuals in order to guide learners cope with their existential concerns with ease and grace. There is also a need to enable learners to be confidents about their thinking skills, interpersonal skills, and emotional skills leading to their holistic development. The Focus Areas of the Programme are:

- Winning Communication Skills.
- Relationship Skills.
- Leadership Skills.
- Research Skills.
- Digital Skills.

For further details, contact Organising Secretary, Teaching Learning Centre, ABLT Complex, Indian Institute of Technology (BHU) Varanasi- 221005, Mobile No: +91 9451596698/ +91 9616169656, E-mail: office. *tlc@itbhu.ac.in* / *akmishra.hss@iitbhu.ac.in* / *panpanda.hss@iitbhu.ac.in*. For updates, log on to: *https://www.bhu.ac.in/seminar/seminar.php*

Online Faculty Development Programme on Energy Storage

A five-day Online Faculty Development Programme on 'Energy Storage' is being organized by the Indian Institute of Information Technology Design and Manufacturing, Kancheepuram, Chennai, Tamil Nadu during October 27-31, 2020. The event is sponsored by All India Council for Technical Education.

Energy storage systems are essential to the operation of electrical energy systems. They ensure

continuity of energy supply and improve the reliability of the system by providing excellent energy management techniques. Energy storage systems can be in many forms and sizes. Energy can be stored as potential, kinetic, chemical, electromagnetic, thermal, etc. Some energy storage forms are better suited for small-scale systems as well as for large-scale storage systems. Some of the energy storage systems are chemical batteries, fuel cells, ultra-capacitors, super capacitors, superconducting magnetic energy storage (SMES), and fly wheels, etc. The potential applications of energy storage systems includes utility, commercial and industrial, off-grid & micro-grid systems. Energy storage systems help with frequency regulation, can reduce a utility's dependence on fossil fuel generation plants, and shifting to a more sustainable model over time. Renewable with energy storage can act as the base load power source of a micro grid and reduce the use of fossil-fuel based generators. The proposed program covers energy storage systems and applications, including the various methods of energy storage and their incorporation into and integration with both conventional and renewable energy systems. The Course Contents of the event are:

- Types and Futures of Energy Storage Systems.
- Standards and Technical Comparison.
- Use of Energy Storage in PV Generation Systems (Wind & PV).
- Design, Control and Application of Battery Energy Storage in off-grid System.
- Energy Storage Technologies for Hybrid Energy Systems.
- Renewable based off-Grid/Grid-Interactive Systems and Their Control.
- Battery Storage and Electrical Vehicle Integration.
- Modelling and Design of Energy Storage.

For further details, contact Coordinator, Dr. B Chitti Babu, Assistant Professor, Photovoltaic (PV) Research Lab, Indian Institute of Information Technology Design & Manufacturing Kancheepuram, Chennai-600127,Tamil Nadu, Mobile No: 04427476377, 9840126942, E-mail: *bcbabu@iiitdm.ac.in*. For updates, log on to*: www.iiitdm.ac.in.*

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THESES OF THE MONTH

HUMANITIES

A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of August-September, 2020)

Geography

1. Chattaraj, Diyali. **Assessment of wetland resources in Malda District and its conservation for sustainable management**. (Prof. S Sarkar), Department of Geography and Applied Geography, University of North Bengal, Darjeeling

History

1. Babu, B C. **A study on G Madegowda's thought and struggle**. (Dr. S Shivaramu), Faculty of Social Sciences, Kannada University, Hampi, District Bellary.

2. Bharti, Anu. **Mugal kaal mein kshetriye bhasha-sahitye ka vikas (1526-1857)**. (Dr. S K Mishra), Department of History, T M Bhagalpur University, Bhagalpur.

3. Jyoti Kumari. **Bihar ka kisan aandolan aur Bhartiye Rashtriya Congress (1917-1942)**. (Dr. Dharmendra Kumar), Department of History, Lalit Narayan Mithila University, Darbhanga.

4. Khatri, Sunil. **Contribution of Sindhi Community in Indian independence struggle and re-glorification of India: An analytical study**. (Dr. Ravindra Bhardwaj), Department of History, Vikram University, Ujjain.

5. Lakshmi, G R. **Collector of sources in history colonel mackenzie: A historical analysis**. (Dr. B S Puttaswamy), Department of History, Kannada University, Hampi, District Bellary.

6. Mona, Jaqueline Mendonca. **The apostolic Carmel congregalion: Women education and social change in coastal Karnataka (1870-1970)**. (Dr. Denis Fernandes), Department of History, Kannada University, Hampi, District Bellary.

7. Prabhatha, B. **Socio economic study of Tulu Nadu under Keladi Gowda S**. (Dr. Ganapathi Gowda S), Faculty of Social Sciences, Kannada University, Hampi, District Bellary.

Languages & Literature

Bodo

1. Basumatary, Alka. **A study on acculturation of the Bodos and its trends: With special reference to undivided Kokrajhar District of Assam**. (Dr. Dinanath Basumatary), Department of Bodo, Bodoland University, Kokrajhar.

2. Basumatary, Bridul. **Part of speech annotation in Bodo**. (Dr. Bhupen Narzaree), Department of Bodo, Bodoland University, Kokrajhar.

English

1. Akash. **Mahesh Dattani's response to contemporary India: A study of selected plays**. (Dr. Sunita Siroha), Department of English, Kurukshetra University, Kurukshetra.

2. Chinta, Praveen Kumar. **Romantic realism: A comparative study of the select fiction of FM Dostoevsky and JM Coetzee**. Department of English, Telangana University, Nizamabad.

3. Roy, Subhra. **Reconfiguring the self-other dichotomy: An interrogation of the issues of Naga nation and identity in the works of Easterine Kire Iralu**. (Prof. Ashes Gupta), Department of English, Tripura University, Suryamaninagar.

4. Sharma, Emily. **Interrogating feminism in Indian perspective: Issues of theory and praxis**. (Prof. Ashes Gupta), Faculty of Arts & Commerce, Tripura University, Suryamaninagar.

5. Sigha, Sukla. **Analyzing and situating English poetry of the North-East towards the formulation an alternative canon: Problems and issues with reference to select poets and texts**. (Prof. Ashes Gupta), Department of English, Tripura University, Suryamaninagar, Tripura West.

6. Wani, Aasif Rashid. **Family relationship in the novels of select Indian English women novelists**. (Dr. Naveen Kumar Mehta), Department of English, Sanchi University of Buddhist-Indic Studies, Bhopal.

Hindi

1. Anjan, Amlendu Kumar. **Bhartiyeta ke nikash par Agyeya ka sahitye: Ek vishleshan**. (Dr. Vidya Rani), Department of Hindi, T M Bhagalpur University, Bhagalpur.

2. Kokani, Jigneshkumar Khalpabhai. **Mahasweta Devi ke katha-sahitye mein samajik chetna**. (Dr. N T Gamit), Department of Hindi, Saurashtra University, Rajkot.

3. Krishnanand Kumar. **Giriraj Kishore kee kahaniyoan ka samajshastriye adhyayan**. (Dr. Subodh Mandal), Department of Hindi, T M Bhagalpur University, Bhagalpur.

4. Patel, Rajeshkumar Arvindbhai. **Harpalsingh 'Arush' ke katha-sahitye mein dalit chetna**. (Dr. N T Gamit), Department of Hindi, Saurashtra University, Rajkot.

5. Sneh Lata. **Ratankumar Sambharia ke sahitya main samajik chetana**. (Dr. Kamraj Sindhu), Department of Hindi, Kurukshetra University, Kurukshetra.

6. Sujata Kumari. **Angika ka bhu-bhashkiye adhyayan**. (Dr. Bahadur Mishre and Dr. Sachidanand Pandey), Department of Hindi, T M Bhagalpur University, Bhagalpur.

7. Verma, Ravi. **Kusum khemani ke sahitya mein samajik sarokar**. (Dr. Vidya Devi), Department of Hindi, Kurukshetra University, Kurukshetra.

Kannada

1. Bandi, Vinoda Maruti. **Sati system in the pre-modern Kannada literature**. (Dr. S R Channaveerappa), Department of Manuscriptology, Kannada University, Hampi, District Bellary.

2. Basavaraj, Janagouda. **Neo oral literary dimensions of North Karnataka**. (Dr. M Mallikarjuna Gowda), Department of Kannada Literature Studies, Kannada University, Hampi, District Bellary.

3. Beladadi, Shradda. **Kannada Janapada kathana geetegalalli mahila lokada vinyasagalu**. (Dr. S F Jakabal), Faculty of Language, Kannada University, Hampi, District Bellary.

4. Gangadhar, Masanakatti. **The main trends of Kannda short stories in the context of globalization**. (Dr. Vinaya G Nayak), Faculty of Language, Kannada University, Hampi, District Bellary.

5. Gangappa, Medidar Gururaj. **Children's literature in Kannada: The philosophical form of expression**. (Dr.V S Mali), Faculty of Language, Kannada University, Hampi, District Bellary.

6. Goravar, Nimbanna Ningappa. **Ittapa tradition: A cultural study**. (Dr. F T Hallikeri), Department of Manuscriptology, Kannada University, Hampi, District Bellary.

7. Kumara, H. **Nature of the theoretical and expression mode in the stories of Veen Shanteshwara, Vaidehi and Geetha Nagabhushan**. (Dr. Amaresh N), Department of Kannada Literature Studies, Kannada University, Hampi, District Bellary.

8. Lakshmi, G M. **The nature of cultural conflicts in the works of Alanahalli and Tejaswi**. (Dr. A R Madanakumar), Faculty of Language, Kannada University, Hampi, District Bellary.

9. Manjunatha, M M. **Hasivina parikalpane: Prathinidhika Kannada Sanna Kathegala Hinneleyalli**. (Dr. Varadaraja Chandragiri), Faculty of Language, Kannada University, Hampi, District Bellary.

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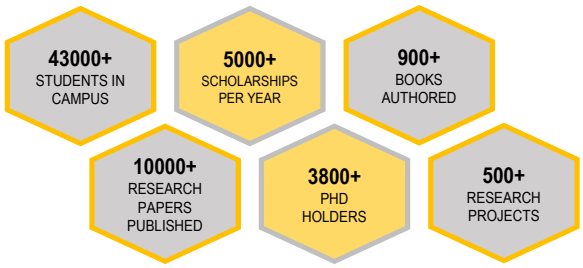

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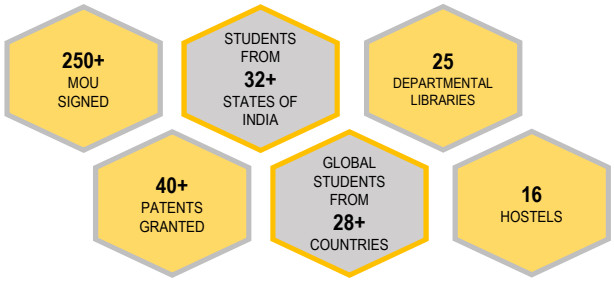

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