REIMAGINING INDIAN UNIVERSITIES
LEARNING FROM THE GLORIOUS PAST FOR BUILDING A NEW INDIA

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The University System after COVID-19 will be very different. Future education will be blended and technology enabled. The Indian Education System in the 21st century requires a new model of a forward-looking University system rooted in Indian culture. The new model of the University System needs to be based on a transdisciplinary approach bringing academic excellence, flexibility, professionalism, and self-reliance and integrating traditional and modern knowledge to make it locally relevant and globally competitive to serve not only national development but the larger cause of humanity as well. The Indian knowledge systems comprising Darshanas (philosophical world-views), Vidyas (knowledge sources), and Kalas (specialized skills) can be integrated with the present-day mainstream university education. Insights from our cultural past can help us to re-imagine and re-model 'New Universities' to meet the vision of 'New India'.

PRELUDE

The 21st century is essentially dominated by the information/knowledge driven society. India is well equipped with critical outlook to discover its contemporary relevance in global milieu from its own intellectual and cultural traditions. Those, who are well read and can see and understand the vast magnificent backdrop of India's past, have for long rejected the colonial myth that inspiration for modernity can only be imported from the West. History is a continuum, not an event or an era, and the true nature of modernity in all societies has to be derived from evolving traditions. Today, the mono-culture dominance in knowledge systems is already being replaced in disciplines like philosophy, history, archaeology, linguistics and fine arts by transdisciplinary or cross-cultural perspectives which widen intellectual frameworks for comprehension of nature and society. Knowledge leaders are increasingly becoming aware that the monopoly of any particular knowledge tradition to comprehend reality is limited and is a politically conditioned assumption about the past.

Globally, universities need to break out of the stranglehold of a single cultural and intellectual tradition that has dominated knowledge institutions since the 19th century and become multicultural. They need to urgently engage in critical review and discovery of contemporary roots in their own indigenous cultures in fields like health

sciences, agriculture, social sciences, architecture, mathematics, logic, philosophy; the fine, visual and performing arts. A modern university in any society need not follow a uniform design. They need to adopt transdisciplinary approaches respecting both indigenous and western scholarship for bringing innovation, academic excellence, flexibility, professionalism and self-reliance. They can do so by integrating traditional and modern knowledge systems to be locally relevant and globally competitive in order to serve the national development and the larger cause of humanity. Although India became independent in 1947, its history, its culture, its science extends back to thousands of years in antiquity. The Indian knowledge systems are a rich source of evolving knowledge. They comprise diverse schools of philosophy that offer mature propositions and sophisticated logic for understanding and experiencing relationship between the observer and observed. They embody fourteen knowledge categories or *Vidyas* which classify differently multiple dimensions of knowledge about nature and society. They include sixty four *Kalas* or specialised skills. This rich heritage needs careful examination to identify the fields that should be an integral part of modern Indian university education system. Learning from an ever evolving tradition can help us to reimagine and re-model new universities to construct and support the vision of a New India. It must be emphasised that re-imagining Indian universities does not mean discarding or replacing existing system with Indian knowledge system. This is an intellectual exercise to understand value and contemporary relevance of Indian knowledge systems in the modern world. The quote of William Bruce Cameron, "Not everything that can be counted counts, Not everything that counts can be counted," is worth remembering here. Also, let's not forget what Charles Darwin said about evolution: "It is not the strongest, it is not the smartest, but it is the most adaptable and resilient of the species that survive and prevail in the long run."

Ancient Indian knowledge sources, *Vidyas* and *Kalas* can be sources of new ideas and innovation. It is important for our university system to critically review, revise, regain and promote these sources of knowledge, art and skills as an integral part of education system. While adopting these sources we should not become dogmatic by taking a stand that 'we know everything'. We must avoid 'self-pride-past-glory' syndrome. It is important to keep open mind to welcome new ideas and our quest to add new knowledge must continue.

Legacy of Indian Civilization

The evolving Indian civilization excels in metaphysics as also in science, mathematics, astronomy, pharmacology, numerical, geometry, algebra, trigonometry, and medical sciences. Indian knowledge has an evolving legacy from Indus valley civilization, from Vedic, Buddhist, Jain and hundreds of local knowledge traditions. Until the advent of foreign invasions, Indian civilization was a center of learning in several branches of knowledge for scholars from all over the world especially South East Asia, Middle East and Europe. The origin of various branches of mathematics, science, art, and philosophy attributed to this civilization are truly remarkable. Indian scholarship aspired to know everything that the mind can comprehend from the atom to the universe.

Indian legacy in scientific disciplines is profound. Panini, a Sanskrit Grammarian gave a comprehensive and scientific theory of phonetics, phonology, and morphology (near 600 BC) which even today is recognized to carry the most unambiguous rules of grammar for machine translation. Charaka introduced systemic perspectives for understanding biological change, cause–effect relationship and evidence-based approach to medicine, Sushruta is the pioneer of surgical tradition all over the world (near 400 BC). Kautilya was an Indian Teacher, Philosopher, Economist, Jurist and Royal Advisor whose *Arthashastra* is considered as a classic in political economy. Original contributions of master Astronomer and Mathematician, Aryabhatta (476 AD) are well recognized. In his classic text, *Aryanbhatiyam*, he describes the process of measuring the motion of planets and eclipses. Aryabhatta proclaimed that the earth is round, that it rotates on its axis, that it orbits the Sun, and is suspended in space. Aryabhatta's most significant and well-known contribution is the concept of zero. Varahamihira (499–587 AD), in a classic text, *Pancha Siddhanta*, notes that the Moon and the planets are lustrous, not because of their own light, but due to sunlight. In the Brihad Samhita, he detailed many discoveries in the domains of geography, botany, and animal science. Nagarjuna (800 AD), in the classic text, *Rasa Ratnakara*, outlined many interesting experiments in metallurgy, and bio assimilable drugs made from metals and minerals. Another great scholar and Master of Arithmetic and Astronomy was Bhaskaracharya (1114–1183 AD). In his classic text, *Surya Siddhanta*, he made a note on the force of gravity. The appreciation of ancient knowledge and scholarship can help us to rediscover our own roots by tracing history and philosophy of Indian medicine as an example[1]. These are merely but glimpses indicating intellectual legacy of Indian civilization.

It is noteworthy that recently prestigious national institutions such as Indian Institute of Technology at Gandhinagar and Kanpur are offering full courses on Indian Knowledge Systems. A lucid introduction to philosophy and characteristic features of Indian knowledge system is provided by Kapil Kapur and A K Singh[2]. A good orientation to these knowledge systems can provide valuable insights for reimagining Indian University system.

Indian University System

Historical evidences show that over fifteen ancient universities existed from the period 6th century BC to 1200 AD. Takshashila is known to be the oldest. Nalanda was established in 5th century and remained the center of excellence till it was destroyed in the 12th century A D. Other lesser known universities include Vikramshila, Mithila, Valabhi, Pushpagiri, Odantipuri, Somapura just to name a few. Dominant schools of thought-systems represented by various *Darshanas* form the philosophical foundations of Indian knowledge and education system. It is estimated that sometime during 600 BC the *Ashram* System gradually evolved in several multidisciplinary universities such as Takshashila, Nalanda, Vikramshila and many more. Takshashila was a centre of learning for several centuries best known because of its illustrious alumni such as Kautilya, Panini, Charaka, Vishnu Sharma, Jivaka.

The modern application of the *Guru Kula* system which involved close and highly personalised interaction between *'Guru'* (teacher) and *'Shishyas'* (disciple) is worth exploring to restore value education. Ancient Indian University campuses such as Takshashila or Nalanda were essentially multidisciplinary hubs with several spokes for specialized studies. The depth, diversity and rigor of education in ancient Indian universities were exemplary. The pedagogy was based on inquisitiveness, enquiry, dialogue, discourses, debates, critical thinking, rationality and evidence-based approach. The universities in ancient India had a unique structure akin to hub and spoke model that were able to ensure holistic development of students to make them highly skilled professionals, artisans, thought leaders, warriors, nation builders, responsible citizens and humble human beings. Almost till 12th century, Indian universities used to attract students from different parts of the world.

The period from 6th century BC to 12th century AD may be considered as golden period of Indian scholarship and education. However, frequent invasions, conquests, gradually led to destruction of Indian universities. Ironically, entangled with internal and external adversities, India remained isolated from the benefits of industrial revolution and was gradually entombed by colonial rule. Even after seven decades of independence, India still has not been able to come out of these influences to rediscover its own roots, strengths and knowledge sources. While reimagining Indian Universities for the future, these philosophical and historical underpinnings must be carefully considered. While one cannot live today only on past glory, it is worthwhile to draw inspiration from these achievements to demonstrate contemporary relevance and explore future innovations.

Education Transitions

English dominated universities were established in India during the British Raj primarily to create a bandwagon of clerks and bureaucrats to serve the rulers. These universities primed by Macaulay's strategy ensured erosion of local languages, culture and Indian knowledge systems. During the colonial period, British Raj started universities mainly to distort cultural identity of locals and to develop human resource needed as workforce for the rulers. This was the beginning of Macaulayism.

During British regime the Indian education system was completely distorted to suit requirements of rulers. Macaulay identified that prevalent education system in India was responsible for attachment of Indians to their own tradition, culture and rituals. He recommended a policy of introducing English language dominated education system. Indian knowledge systems were completely sidelined or replaced with western systems, be it sciences, humanities, engineering and medicine. This resulted in suppression of Sanskrit and regional languages endorsing supremacy of English. Establishment of convent schools, colleges and universities in Mumbai, Kolkata, Chennai and many other cities triggered process to establish British education system in India. It must be acknowledged that a few well-meaning British officers also helped to preserve Indian knowledge systems including Sanskrit and also introduced technology education, which lead to establishment of institutions such as Sampurnanand Sanskrit Vishvavidyalaya in Kashi, Hindu College in Pune and Thompson Engineering College in Roorkee.

The dominance of English became so powerful that many education institutes established through nationalist movement also had to fall in line with the British model. The main objective of university education shifted from scholarship, knowledge generation and innovation to assembly line production of graduates who could serve in colonial establishments more as bandwagon of clerks and *babus*. During this period, India witnessed a transition from *Guru Kula* to *Kula Guru* system consisting of universities led by vice chancellors. The present *Kula Guru* system focuses more on power of position, imposed regulations and memory recalls as measures of academic rigour rather than actual learning and personality growth as the gold standard. Buildings, departments and laboratories were organised more for compliance with insufficient evidence supporting their actual use. The earlier rigour and spirit of scientific inquiry for discovery are largely missing in current conventional education and practice. While reimagining Indian universities it is necessary to understand comparative characteristics of *Guru Kula* and *Kula Guru* systems (Figure 1).

Education Policies

Educational system in India has gone through major challenges since the infamous Macaulay's Minutes in 1835, followed by the Wood's Dispatch in 1854 and Hunter Commission in 1882. After independence, the Indian higher education system has witnessed several phases. A careful review of major recommendations starting with Dr Radhakrishnan Commission 1948, followed by Kothari Commission 1966; National Education Policies (NEP) of 1968 and 1986; Yashpal Committee 1993; National Knowledge Commission 2006; Tandon Committee Report 2009; and the third National Education Policy 2019 reveal that the challenges in education were identified and possible resolves were recommended long ago.

FIGURE 1: CHARACTERISTICS OF THE *GURU KULA*
AND *KULA GURU* SYSTEM

Guru Kula	*Kula Guru*
Master - Disciple Relationship	Teacher - Student Requisite
Spontaneous Life-oriented Learning	Structured Teaching of Syllabus
Learning by Doing	Rote Learning
Personality and Individual Potential	Uniform and Mass Education
Philosophy Lineages	Technical Expertise
Shastra-based *Adhyayan*	Sciences based *Adhyapan*a
Ethical Growth	Professional Excellence
Compassion: Driving force	Commercial Success: Key motivation
Yogic Calmness	Competitive Stress
Contentment	Disenchantment
Curiosity and Creativity	Conformity and Imitation

Most of the earlier commissions and committees regarding the university system and education have visualised similar reforms. For instance, the Kothari Commission Report's covering letter dated 29th June, 1966 has the following statement: "In a science-based world, education and research are crucial to the entire developmental process of a country, its welfare, progress and security." It highlights importance of a built-in flexibility to adjust to changing circumstances and underscores the importance of experimentation and innovation. Prof Kothari further writes in the covering letter, "If I may say so, the single most important thing needed now is to get out of the rigidity of the present system. In the rapidly changing world of today, one thing is certain: yesterday's educational system will not meet today's and even less so, the need of tomorrow." He hoped that the report would provide some basic thinking and framework for educational revolution in the country. A few excerpts from Kothari Commission can make this point amply clear. "Introduction of work experience (which includes manual work, production experience, etc.) and social service as integral parts of general education at more or less all levels of education; stress on moral education; and inculcation of a sense of social responsibility. Schools should recognise their responsibility in facilitating the transition of youth from the world of school to the world of work and life; vocationalisation of secondary education; the strengthening of centers of advanced study and the setting up of a small number of major universities which would aim to achieve the highest international standards; special emphasis on the training and quality of teachers for schools; education for agriculture; and research in agriculture and allied sciences should be given a high priority in the scheme of educational reconstruction; energetic and imaginative steps are required to draw a reasonable proportion of talent to go in for advanced study and research in the agricultural sciences; development of quality or pace-setting institutions at all stages and in all sectors." It is seen that the Indian education scenario visualised in 1966 by Prof Kothari still remains more or less the same. Interestingly, it has striking similarity with the 3rd NEP 2019 draft report submitted by a committee chaired by eminent Scientist Padma Vibhushan Dr K Kasturirangan. Striking similarity between recommendations of all the three NEPs indicate immediate need for their long-awaited effective implementation.

One of the special features of the 3rd NEP is its emphasis on study of Indian knowledge systems. The Indian knowledge systems may not be studied only to know our glorious history and to feel proud. It is crucial to discover their contemporary relevance and potential for future innovations through serious academic study and rigorous transdisciplinary research.

University Education

A University is considered as an institutional space where community of teachers and scholars is engaged in higher education and research. Universities award academic degrees in various academic disciplines. Universities are temples of knowledge where ideas, innovations and skills are nurtured. Universities are seats for scholarship, statesmanship and universal brotherhood. Universities are not to be reduced to degree factories. University education is holistic in nature to inculcate knowledge and skills

necessary to shape an individual's personality and career. For a young country like India, university education plays very vital role to ensure benefits of demographic dividend. Meeting aspiration of young population and empowering them to contribute to nation building are the most urgent priorities for India. University education is expected to prepare young students as skilled professionals and responsible citizens. University education is also expected to produce employable graduates by focusing on social, academic, cultural, professional and intellectual development to enable students to earn respectable livelihood and emerge as responsible global citizens. The university education will have to continuously innovate to address the changing needs of humanity, civil society etc. and not just markets.

Role of a Teacher

To be able to re-imagine Indian universities, it is necessary to re-discover the role of a teacher from Indian traditional perspective. A typical university teacher is designated and described only in one category i.e. 'Professor'. Further distinction is based on seniority as assistant, associate and full professor. The ancient Indian tradition has shown remarkable wisdom to define the role of teachers with help of unique titles with profound meaning that current modern system has not been able to articulate. A teacher who merely gives information is designated as *Adhyapak*; one who imparts knowledge combined with information is designated as *Upadhyaya*; one who also imparts skills is designated *as Acharya*; the one who is able to give deep insights in specialised subject is known as *Pandit*; and the one who brings visionary views, promotes criticality and thinking is known as *Drashta*. The highest level of teacher is the *Guru* who is able to awaken wisdom and liberate pupils from darkness to light. In the *Guru Kula* system, education was about educing the latent capacities and potentialities of the pupils concerned. It was treated as a process of biological development and not as a mere mechanical process operating on the basis of a collective drill and training.

Typically, teaching during colonial period was a one-way process where teachers used to teach students mainly by providing information with the help of textbooks and notes. Of late, while teachers have started using technology, it is limited more to use of word processing, power point presentations, videos and internet sources. Most of the time we are using 21st century technology with an 18th century mindset and continue to bombard students with an overload of information. Today, teachers are not needed to provide information because it is easily available and students are much smarter to get it faster. Today's students cannot be considered as empty boxes where a teacher is authorised to fill information as per set curriculum. With the advent of electronics, computers and multimedia, one-way passive teaching process, which was dominated for several decades, is getting obsolete. The new way of education is based on interactions and the spirit of collaborative learning, video conferencing, skype, wikis, blogs and other social networking in the classroom. Teachers need to change and adopt these new pedagogical ways. There is an urgent need for faculty to come out from the passive style of teaching. They cannot continue to be mere information providers. Advances in Artificial Intelligence (AI) and social robotics can

actually make such teachers redundant. These are real disruptive threats confronting conventional teaching faculty in university system.

At present, faculty, particularly related to undergraduate programmes is involved more in monotonous, monologues and monopolized delivery of education. The average full-time permanent teacher remains largely insulated from the broad changes taking place in higher education. There is a widespread perception that development and control of content is shifting from conventional stand-alone institutions to communication networks. Colleges and universities may not remain sole providers of education. Teachers will have to respect capabilities and aspirations of students. They need to engage with students and become part of active learning process. In addition to imparting knowledge and skill, they need to create an environment of self-discipline, trust, and accountability by inculcating values and enhancing principles of ethics and integrity among students. Students join a university primarily to study, to build their careers and to experience collaborative learning. Education should shape their minds and lives, encourage inquisitiveness, nurture human values, inculcate tolerance, environmental sensitivity and passion for peace. Teachers must inspire young students to take education seriously and let them not become puppets of politicians. Teachers must present themselves as role models and ensure that students stay away from any kind of violence. Teachers must protect universities and students from antisocial elements. Teachers must channelise their energy for nation building and creativity to promote civil society. They need to be the facilitators and mentors to emerge as *Gurus* to be looked at as role models.

Future Education

The contours of future education are becoming visible with the advent of automation and smarter social robots. The future education will require an entirely different knowledge base and skill sets to develop students as global citizens (Figure 2). It will need more creativity, cognitive ability, critical thinking, passion and

FIGURE 2: UNIVERSITY STUDENT AS GLOBAL CITIZEN

compassion. In future, disruptions emerging through technology and content will be readily available, making way for the new university system that is ready for Industry 4.0 revolution. It should be technology-enabled, flexible, modular, collaborative, cross-institutional, cross-cultural, where learners can play a key role as creators of knowledge challenging monopoly of teachers. Very soon Artificial Intelligence (AI), Machine Learning (ML), Deep Learning, Cybernetics and Robotics will dominate the education content and delivery. This is supposed to be more of self-directed and self-paced learning triggered by interest learning where problem-solving, innovation and creativity drive education. Future education will have to be competency-based instead of mere information or knowledge-based; demand-driven instead of supply-driven, by incorporating skills that are capable of adapting disruptive technologies. Education in future will be more flexible, modular, lifelong with more emphasis on Emotional Quotient than Intelligence Quotient. The new education will have to meet the needs of industry, economy and development, enabling collaborative convergence of man and machines as CoBots to explore new pedagogies.

Future universities will have to maximize the power of digital technologies, MOOCs, animated laboratories and personalized data from the interconnected world. The advances in automation, AI, ML and robotics may soon take over several functions of professionals including teachers and doctors. Eminent Entrepreneur and Investor Vinod Khosla predicts that robots might replace doctors by 2035. This prediction is also applicable to conventional teachers. Just last year a robot named Xiaoyi, developed by Tsinghua University and a leading AI company iFlytek Co., Ltd., had taken the national medical licensing examination in China. Xiaoyi not just passed the test but got a score much above the highest percentile. Recent studies indicate that robots show great promise in teaching restricted topics with the effects almost matching those of human tutoring. The future education may be dominated by collaborative robots where teachers and students together become CoBots. Already AI-based voice assisted devices like Siri, Alexa, chatbots like Eliza, and humanoid robots like Asimo, Sophia and our own Indian Mitra are in action. Microsoft's recent AI-based hologram technology can immensely help to remove language-linked knowledge barriers and open possibility of education in mother tongue as well. It is possible that classrooms of the future will feature social robots to assist a human teacher and actually help them to enhance their capabilities. It is now amply clear that the education sector can no longer ignore the technological advances that are real and present. The early signs of disruption are already palpable. The future universities will have to adopt, survive and thrive taking advantages of this disruption.

Blended pedagogy

The future education will be blended and technology enabled. Universities will have to adopt online learning component in every program. The future education will be a blend self-learning, co-learning and learning-by-doing. The future education will be a appropriate blend of online, open-and-distance, classroom-based, community-

based, internship-apprentice-based. Advances in technology are likely to disrupt monopoly of teachers and universities.

The current silos such as campus-based, correspondence, external, distance learning, online, etc will slowly disappear. The futileness to offer education exclusively by any one of these modes will be intensely realized. The future education and pedagogies can be best built on four stages teaching-learning as described by Indian knowledge system as follows:

- Adidhi (information and theory): This is about gathering information and learning theory. This can be attempted by students through self-study modules exclusively with MOOCs. This may require teachers as facilitators.

- Bodha (understanding and analysis): This is about gaining knowledge, deeper awareness, understanding principles, theory, comprehension and analysis based on available information. This can be attempted by students through assisted learning with MOOCs. This may require social robots and teachers as mentors.

- Acharana (performance and practice):This is about using acquired knowledge, testing principles, experimenting and practicing. This can involve intense interaction between students and teachers.

- Pracharana (propagation and preaching): This can involve community-based learning, internship, apprenticeship, seminars and presentations.

Educational experience in lines described above can give a holistic, participative, proactive model of teaching-learning. A substantial component of most programs involves delivery of information. At one point, 'lecture notes' giving information to students was a power of teacher. Today, in the 5G world teachers are not required to do this job. Students are much smarter to get information if they are properly mentored. This component can be handled by creating online information repository where students can self-learn. Social robots can do this job effectively and efficiently. Every program involves a theory component where the available information needs to be used to understand the basic principles of the respective subjects. This can be done by developing high quality MOOCs supported by teachers as mentors. Understanding the importance of theory requires intense interaction with teachers. This component will have to be in the classroom where the teacher is in command. Hands-on experience, practical training, internship, apprenticeship programs which can happen on the campus laboratories, workshops, industry sites or any other suitable place.

Broadly, any education program can be divided in the four stages of teaching-learning. The actual need for 'Teacher on Campus' may require in about 50% of the teaching-learning process of any program. In case of general education undergraduate programs, this may be higher while for some specialized professional programs it may be lower as well. In principle, it is possible to offer at least 40 % of the teaching with help from technology, be it online or otherwise. Of course, to implement this entirely different breed of teachers will be needed. Adopting such a blended approach may have several advantages: First, it may empower students to earn academic credits for component at their own speed and convenience. Second, the quality of education will

improve because of a new focus on learning-by-doing in the blended mode. Third, infrastructural needs on the campus may be reduced. Fourth, mass production of poor-quality degrees under the pretext of open/ distance/ online programs can be controlled. Fifth, access to education will be enhanced due to use of technology in delivery. Sixth, cost of education will be drastically reduced, making it more affordable. This approach will be very appropriate especially in the post COVID era.

Re-building on Strengths

Indian knowledge system comprising of *Vidyas* and *Kalas* consists of knowledge and skills as well as theory and practical components. This is our strength. Ancient Indian universities such as Nalanda and Takshashila were offering holistic education with a unique blend of knowledge and skills. Indian knowledge system describes nine *Darshanas*, fourteen *Vidyas* as sources of knowledge and sixty four *Kalas* as specialized art and skills. Six sets of *Darshanas* offer various point of views as an open knowledge system (Figure 3). Fourteen *Vidyas* include 4 *Vedas*, 4 *Upavedas* and 6 *Vedangas* (Figure 4). *Kala* means performing art in Sanskrit. Kala also mean specialised skills. In ancient India these skills were considered to be important for holistic development of a cultured individual. These specialised *Kala* or skills are believed to be acquired by lord Krishna in 64 days in the *Ashram* of Guru Sandipani. In Indian mythology, Lord Ganesha, who is considered as a master of *Vidya* and *Kala*, is revered as god of education, knowledge and intelligence. The imagination and diversity of *Kala* is astonishing (Figure 5). Several *Vidyas* and *Kalas* remain very precious in current context as diverse dimensions of life. Some of the *Vidyas* and *Kalas* may not be alive, relevant, or may have become obsolete. However, it is necessary to protect, preserve, cultivate and enrich them by adding contemporary relevance.

FIGURE 3: INDIAN KNOWLEDGE SYSTEM I: DARSHANA
(PHILOSOPHICAL POINT OF VIEWS)
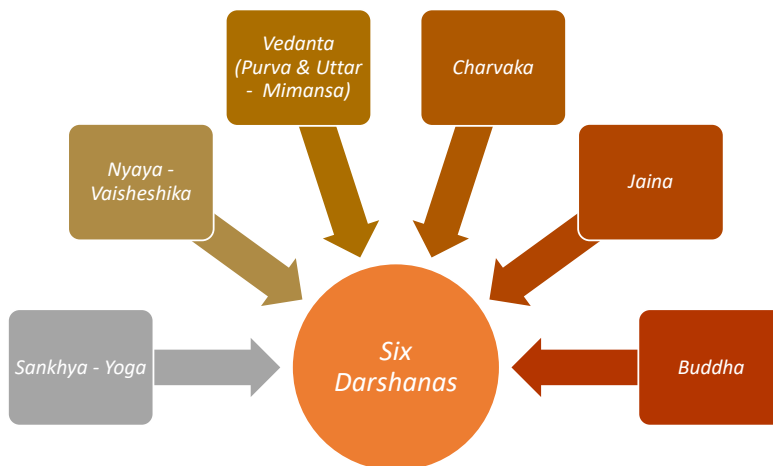
Samkhya - Yoga, Nyaya - Vaisheshika, Purva Mimansa-Uttar Mimansa (Vedanta) are called *Astik Darshanas* because they believe in the authority of the *Vedas*, and the existence of the self (*Atman*). *Charvaka, Jaina* and *Buddh*a are called *Nastika Darshanas* because they do not believe in the authority of the *Vedas*.

The sufferings during the invasions and suppression during the colonial period should give us strength and compel us to think in our own interest. Education shall remain the key driver for transformation and universities will have to own the responsibility. The aspirations of young India seem to be a great hope to break the elitist mindset deadlock and to regain confidence and respect for our own knowledge,

FIGURE 4: INDIAN KNOWLEDGE SYSTEM II: VIDYA (KNOWLEDGE SOURCES)

4 *Veda*	4 *Upaveda*	6 *Vedanga*
• Rigveda • Samveda • Yajurveda • Atharvaveda	• Arthashastra • Dhanurveda • Gandharvaveda • Ayurveda	• Shiksha • Kalpa • Vyakarana • Jyotishya • Nirukta • Chhandas

In Indian knowledge system the term *vidya* is paired with *darsana* and *jnana* in this sequence: *darsana*, (दर्शन), *jnana* (ज्ञान), and *vidya* (विद्या). *Darsana* literally means 'to see' and in the context of Indian knowledge systems it means 'to see' or a philosophical proposition. Such a proposition results into knowledge of reality which is organized or systematized in the form of *vidya* which means a discipline of thought which can be acquired by learning

FIGURE 5: INDIAN KNOWLEDGE SYSTEM III: 64 KALA (ART FORMS AND SKILLS)

Visual & Performing Art	Cognitive and Design Skills	Technical & Artisan Skills	Beauty & Hospitality Skills	Miscilineous Skills
• *Geet, Vadya, Vina-damuraka-vadya, Udak vadya,* • *Nrutya, Natya, Natakakhyayika darshan,* • *Aalekh, Vishesh Kacchedya, Udakaghata, Chitrayog*	• *Indrajal, Dharanmatruka, Kouchumaryog, Hastalaghav,* • *Suchikarma, Sutrakarma, Prahelika, Pratimala, Durvachakayog, Pustakvachan* • *Kavyasamasyapurti, Pattika vetra-ban-vikalpa* • *Samvachya, Akshar mushtikakathan, Deshbhashadnyan, Pushpa-shakatika-nimittadnyan*	• *Turkakarma, Takshan,* • *Vastuvidya,* • *Roupya ratna pariksha, Maniraagdnyan,* • *Dhatuvad, Aakardnyan, Yantramatruka. Chalitakayoga, Abhidhankosh chhandodnyan,* • *Vrukshayurvedyog, Kriyavikalpa*	• *Tandul kusumavali vicar, Pushpastaran, Manibhumika karma,* • *Malya grantha vikalpa, Kesha-shekhara-pidyojana* • *Nepathyayog, Karnapatrabhang, Keshmarjan koushal, Bhushanayojan* • *Shayan Rachana, Chitra Shabdapup Bhakshya Vikar Kriya, Panaka-rasa-ragasava-yojana*	• *Mesh-kukkut-lavakyudhha vidhi, Shukasarika prapalana,* • *Mlencchitkalavikalpa, Vastragopan,* • *Dyut visesha, Aakarshan krida, Balkridakarma* • *Vainayiki vidyadnyan, Vaijayiki vidyadnyan* • *Dashanvasanang raag, Sugandhayukti, Utsadan, Vyayamiki vidyadnyan*

Many *Kala-s* may not be relevant or even existing today. Many may be on the verge of extinction. Many can be contextualized to suit current needs. It is important to undertake their preservation and revival on mission mode before we completely lose them.

languages and cultural heritage. While aspirations of young India are reaching tipping points, the response to change from academics is yet to gain desired momentum. Role of the government, business and society in this process shall never be mutually exclusive. We must ensure that quality higher education does not become the exclusive preserve of the privileged, available only to children of the rich and powerful. We must ensure that our efforts of inclusion address the problems of digital divide in addition to economic divide and bridge the gap between blue and white-collared professionals by seamlessly integrating knowledge and skills in education. We must build new universities using our past knowledge, experience and core strengths.

New Universities for New India

India has to learn from its glorious past. India must regain the global leadership in education. This may not happen merely by achieving place in top 100 in global ranking. India must re-discover, re-visit, re-purpose the basic tenets, philosophy, values, purpose and pedagogy to re-imagine the Indian university system. India has some exemplary efforts in the direction of creating worldclass universities. This includes Banaras Hindu University established by Pandit Madan Mohan Malaviya and Visva Bharati, Santiniketan by Gurudev Rabindranath Tagore. Although, structurally different, both realised the intrinsic values strongly rooted in Indian ethos and scientific temperament. Even today, while several national institutes have been established, not a single university has reached even near the vision of Pandit Malaviya or Gurudev Tagore in terms of holistic education in multidisciplinary environment coupled with Indian ethos and pedagogy.
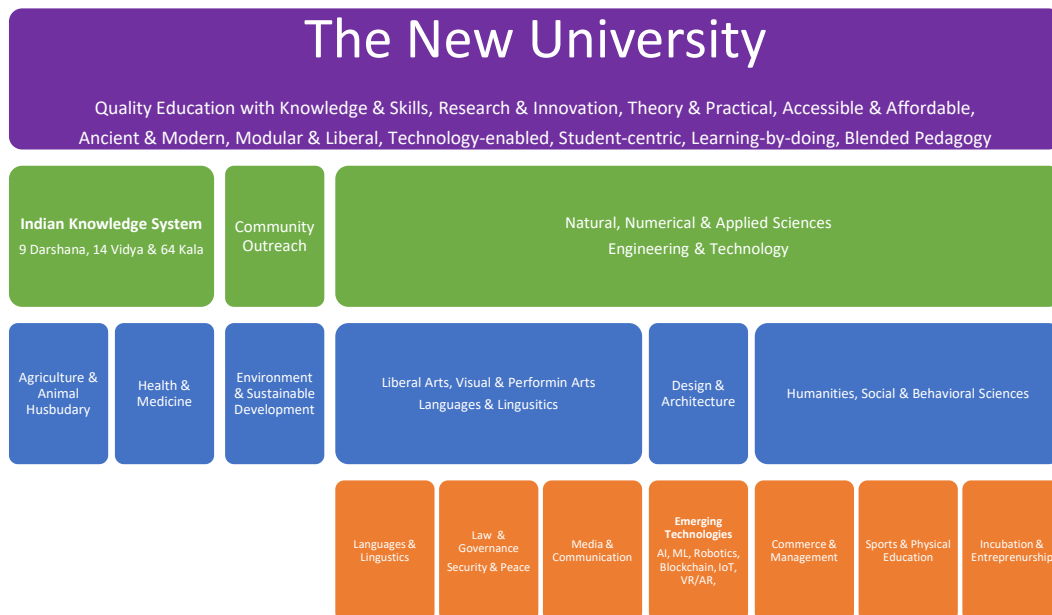
India must re-model and re-build current universities on the foundations of Indian knowledge systems and integrating advanced science, technology, social science, contemporary art and humanities. The Indian university system can be reimagined and re-modeled by taking some bold steps. First is to shed the colonial mindset and understand her own history and glorious heritage. Second, respect her own value systems, culture, languages without losing sight of value of English at the global level. Third, wisely embrace technology-led innovation path without losing sight of sustainability principles. Fourth, revive and recognise diverse artisan skills among her diverse population as part of education. Fifth, ensure respect and mainstream agriculture in university education. Sixth, involve business, industry, governments, voluntary organisations and society in the teaching learning process. Seventh, scrupulously remove redundancy at all levels including academic faculty, courses, content, pedagogy and governance. Eighth, remove blue-collar and white-collar divide by ensuring equal weightage to skill mastery and degree education ensuring equitable recognition to skill providing accountability linked autonomy and encouragement to deserving organizations to innovate new India-centric university models integrating ancient and modern approaches. Finally, it is possible to simultaneously offer high quality education knowledge and skills that can meet aspirations of the youth to earn respectable living, at the same time, attend national needs and serve the cause of humanity. This is unlikely to happen in an incremental manner by doing the same things in different ways or merely by increasing the Gross Enrollment Ratio (GER). It

will be disastrous for a country like India if glorification of hollow degrees produced by existing university factories producing unemployable graduates on assembly line continues. Existing model of the university education must be changed before it is too late, for the future generation should not and will not wait.

Reimagining universities does not mean discarding the western approach or replacing current practices totally. The integration of Indian knowledge systems in education should not be done blindly in a dogmatic manner. The main purpose of this exercise should be to explore their contemporary relevance with an open mind and scientific temperament. This will require imaginative disruptive changes and a complete overhaul to prepare our university education system future ready.

NITI Aayog has articulated a strategy for New India[3]. As we are engaged in progressing towards a New India, it is imperative to reform the education system and reimagine the New University. The quality of university education has to play a vital role in the proposed transformation. We should be able to face the future challenges better if we are able to learn from our glorious past and bring the best from eastern and western civilisations. The 'New' universities should be grounded on the strong foundation of Indian cultural ethos bringing multidisciplinary ecosystem where ancient and modern, *shastric* and scientific temperament, scholarship and global good coexist; where knowledge and skills, theory and practicum, research and innovation are well integrated (Figure 6). Let us hope that we will be able to reimagine and remodel the New Universities that are complementary to the vision of New India in accordance to principles of justice, liberty, equity, sustainability and human values.

FIGURE 6: NEW UNIVERSITY FOR NEW INDIA

The New University

Quality Education with Knowledge & Skills, Research & Innovation, Theory & Practical, Accessible & Affordable, Ancient & Modern, Modular & Liberal, Technology-enabled, Student-centric, Learning-by-doing, Blended Pedagogy

Indian Knowledge System
9 Darshana, 14 Vidya & 64 Kala

Community Outreach

Natural, Numerical & Applied Sciences
Engineering & Technology

Agriculture & Animal Husbudary

Health & Medicine

Environment & Sustainable Development

Liberal Arts, Visual & Performin Arts
Languages & Lingusitics

Design & Architecture

Humanities, Social & Behavioral Sciences

Languages & Lingustics

Law & Governance
Security & Peace

Media & Communication

Emerging Technologies
AI, ML, Robotics, Blockchain, IoT, VR/AR,

Commerce & Management

Sports & Physical Education

Incubation & Entreprenurship

Let us remind ourselves once again, not only of our grand heritage, but also of the challenge and the responsibility that comes with its endowment, by rekindling our spirit and reviving the grandest of the grand invocation that the sage author of Katha Upanishad passed on to us eons ago:

| उत्तिष्ठत जाग्रत
प्राप्य वरान्निबोधत ।
क्षुरस्य धारा निशिता दुरत्यया
दुर्गं पथस्तत्कवयो वदन्ति ॥ १४ ॥[57]

—Katha Upanishad, 1.3.14[55][56] | Uttisthata Jagrata Prapya Varannibodhata Kshurasanna Dhara Nishita Durataya durgama Pathah tat kavayo Vadanti | Arise! Awake! Approach the great and learn from them. Like the sharp edge of a razor is that path, –hard to tread and difficult to cross; say the wise men |

O' you all, rise and awake! Now that you have got this boon (of wisdom), understand it and assimilate it into your mind heart & soul. Indeed, the path to self-realisation is difficult, just like walking on a razor's edge, but march steadfast on it, for this path is worth taking. (arp… interpretative translation)

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The Biography of the Author

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Prof Bhushan Patwardhan is Vice Chairman of University Grants Commission, India. He is a Biomedical Scientist and Fellow of National Academy Sciences (India) and National Academy of Medical Sciences (India). He was Professor and Director, Interdisciplinary School of Health Sciences at Savitribai Phule Pune University, Pune. He is a member of important national committees of the Government of India and apex bodies like University Grants Commission, All India Council for Technical Education, Council for Scientific & Industrial Research, Science and Engineering Research Board, Department of Science & Technology, Department of Biotechnology and Indian Council of Medical Research. He has worked on several policy making bodies including Taskforces of National Knowledge Commission, Planning Commission etc. He was consultant to the World Health Organization, Geneva. He is Editor-in-Chief of Journal of Ayurveda and Integrative Medicine published by Elsevier and is on Editorial Boards of many reputed Journals. He has received several research grants and has guided 19 PhD students. He has to his credit 8 Indian Patents, 2 US Patents, over 120 research publications and 7200 citations.

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