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Dipole and Academic Club Models to Improve Quality of Education

R Jaishanker*

This article is written against the backdrop of recent reports of an alarming increase in the number of students from Kerala moving to foreign universities for higher education. While the trend will be similar for all states of India, Kerala has crossed the threshold, leading to *campus rarefaction* in institutions of higher learning in the state. *Campus rarefaction* refers to the condition when seats in institutions of higher learning remain vacant due to student migration. This posits an interesting case study.

During the closing decades of the twentieth century, transnational student migration was modest[1]. It was mostly an urban phenomenon limited to doctoral and postdoctoral researchers. The opening decade of the current century saw an increase in students migrating for higher education[2]. Over the last decade, there has been a considerable increase in students leaving Kerala for higher studies sans scholarships. Masters and Undergraduate levels are flagged as 'new segments of growth aspiration' in the global educational scenario[3].

Campus rarefaction should be seen as an opportunity, not otherwise.

The adage: *quality attracts quality* applies to educational institutions also. The pursuit of quality offshore education is an option very high on the cards of an increasing number of students who aspire for admission to elite academic institutions in India. The slack in the pace of expansion of quality educational institutions in India, coupled with the rise of the new middle class and soaring aspirations, are the more proximate causes of student migration[4,5]. The author presents two integrative pathways that rely on consolidating the existing strength to enhance the quality of education and thereby stem campus rarefaction.

The annual global higher education market was valued at USD 736.80 billion in 2023[6]. Higher and tertiary education is a commodity in an increasingly competitive, corporatised world. Beyond the physical space of universities, the education market supports a chain of entrepreneurs across the developing world. Universities and entrepreneurs have successfully crafted a symbiotic niche sector in student recruitment. It is interesting to note that universities are now categorised as higher education companies[6]. The niche sector effectively leverages social media to highlight laboratories in *client universities* and project professional success stories. Students will more likely have heard of professors in universities in the developed world but would not be aware of professors in their backyard.

Campus rarefication reported from higher education institutions in Kerala indicates the marketing success of the education service sector. It is important to note that the issue first surfaced as a social concern in a society known for its historic willingness to migrate

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across geographies for knowledge and employment. The high literacy level across generations in the state leads to less parental resistance, thereby indirectly favouring *campus rarefaction*. Coupled with the high density of internet users, particularly the density of internet users in rural areas, and enhanced aspiration of youngsters[7], the entire state is a fertile market for the educational service sector. With the vast pool of locally available creative talent, public institutions of higher education in the state should seriously consider giving a tough challenge to the higher education companies. It will also address backyard ignorance and contribute to student retention.

At the other of the spectrum, there exists a dominant misconception that the quality of instruction at higher and tertiary levels directly correlates with the number of universities. While no statistics support the misconceived correlation, the last decade has seen a rise in public investment to establish many new universities with a narrow academic focus. Beyond satisfying individual aspirations, increasing the number of universities (instead of higher education institutions) only adds to the overall public expense per student seat, added. Public universities with narrow academic focus add to cognitive obstacles and impede interdisciplinarity. The government should consider the opportunity cost of investment in establishing new universities to that of strengthening and reforming the existing ones. With education on the concurrent list, it would be prudent for a state like Kerala to align the focus of its higher education institutions to teaching and applied research that addresses the immediate needs of the state.

Another priority should be leveraging existing research institutions under the state to enhance the overall academic environment. A harmonised configuration of universities and research institutions will act as diploes where the former focuses on teaching (imparting knowledge), and the latter drives research. The dipolar academic environment will generate a field of influence that will help attract students. Implemented professionally, the dipolar model will be a big step forward in improving the quality of education.

The second pathway to help enhance academic standards draws inspiration from the sporting arena. It is the *Club Model* for academic transformation. The sporting club is a time-tested model that identifies and trains talents to perform continuously. Take the instance of a soccer (football) club. It draws talented players from across the globe and teams them with native players. With time, the skill set, disposition, and performance of the native players increase significantly. The club model in higher education should seek to team international faculty/ researchers with faculty from multiple publicly funded universities/ research laboratories. In four to five years, an academic club will guide four times its team strength of doctoral candidates, who will, in the future, help scale up and maintain the professional momentum. Designed fairly and transparently, academic clubs, with native academicians from different institutions working in a Laissez-faire environment, have the potential to attract students and transform the identified sectors across different institutions of higher learning into vibrant learning hubs.

While the resource investment in academic clubs will ebb over time, the returns stretch into the foreseeable future. Over time, healthy competition between different academic clubs will build a vibrant higher education sector that will retain native students, attract students from outside, contribute to social and economic development, and help Governments formulate policies to address emerging challenges. Since the global arena is a theatre of co-existence of diversity and differences with periodic readjustment of equilibrium, it will be wise to concentrate on the opportunity beneath the turbulence of *campus rarefaction*.

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Salvaging Lost Cultural Heritage and Pride: The Indian Knowledge Systems

Arvind Kumar Agrawal* and Ram Lal Bagaria**

The Indian Knowledge Systems (IKS) represent diverse intellectual traditions encompassing philosophy, science, mathematics, astronomy, architecture, and economics (Subbarayappa & Sarma, 1985). Indian society is a veritable gold mine of scientific, societal, artistic, literary, traditional, linguistic, architectural, and customary expressions. As per the National Education Policy –2020, IKS refers to indigenous mechanisms of knowledge, covering subjects like medicine, astronomy, philosophy, mathematics, yoga, agriculture, engineering, linguistics, governance, economy, and polity (National Education Policy, 2020). Indians have been practicing ancient customs and rituals for generations, and they have been passed down from generation to generation. However, in the last several centuries, despite their profound contributions to human knowledge, many aspects of Indian knowledge systems have been marginalized or lost in this process.[1] This paper explores various aspects of the rich culture of ancient knowledge systems.

It proposes ideas for revival by incorporating the Indian Knowledge Systems (IKS) into the education curriculum. By incorporating IKS into curricula at all educational attainments, efforts should be made to preserve and promote Indian languages, arts, and culture. The paper highlights the need for new courses and programmes at undergraduate and postgraduate levels in higher educational institutes. It outlines the model curriculum structure of the undergraduate programme in IKS as per guidelines of NEP 2020, along with other statutory and regulatory policies in this regard. The paper also explores teaching, learning, assessment, and evaluation mechanisms in the newly introduced model curriculum for undergraduate programme in IKS. By reviving and preserving IKS, India can reclaim its lost cultural heritage and pride while fostering a more holistic and inclusive approach to education.

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An essential and foremost step in salvaging IKS is incorporating various aspects of traditional knowledge into the modern education system. By incorporating elements of IKS into curricula, learners may have a comprehensive understanding of their cultural heritage and develop a deeper appreciation for traditional practices (National Education Policy, 2020).

Launching teaching and research programs for different educational attainments in schools and colleges (Certificate, Diploma, Undergraduate, Postgraduate including Research) in India is crucial in promoting India's diverse indigenous knowledge across fields like philosophy, language, medicine, and sciences. New Education Policy (NEP) 2020 has also mandated a clear trajectory for imparting training, education, and research on IKS, necessitating the launching of different programmes at various qualification levels in institutions and universities in the country (New Education Policy, 2020).

University Grant Commission has issued particular guidelines for imparting training in Indian Knowledge Systems for faculty members of educational institutes to inspire the academic fraternity to create an attitude towards IKS and explore and undertake quality research on various aspects of IKS as recommended in NEP 2020.[2] Several Universities, IITs, and IIMs have developed specific courses (value-added courses and elective courses) to impart education and research in IKS to their learners. The All India Council of Technical Education (AICTE) has brought policies for introducing IKS as a minor degree programme as per NEP-- 2020, apart from courses started earlier for learners enrolled in professional programs nationwide. Several courses (Mandatory, Open, and General Electives) have been formulated in IKS as partial fulfillment of Minor degrees at the undergraduate level by learners in regulated institutions.[3]

A separate division named IKS Division has been created in the Ministry of Education for mainstreaming Indian Knowledge Systems for the contemporary world and promoting IKS for further research and societal applications.[4] UGC has introduced IKS as a

subject in the UGC National Eligibility Test (NET) which is a minimum qualification for becoming eligible for Assistant Professor in Indian institutions. After clearance of this examination, learners will also be eligible for fellowship at institutions of higher education and may pursue research degree programmes.[5]

The programmes in Indian Knowledge Systems are multifaceted, serving to promote India's diverse indigenous knowledge across fields like philosophy, linguistics, medicine, and sciences. These courses are vital in creating an academic community focused on advancing traditional knowledge, trained and professional workforce, and promoting interdisciplinary research. The courses in the programme provide a holistic education, blending traditional wisdom with modern knowledge, thus offering learners a comprehensive and detailed understanding of various subjects of ancient knowledge (Mahadevan et al., 2022).

In these circumstances, as part of academic administration, launching an Undergraduate Programme fully devoted to Indian Knowledge Systems (IKS) is crucial and a positive move towards promoting IKS, as no such programme is currently available in the country. This paper designs the model curriculum structure of a unique and first-of-its-kind undergraduate program in Indian Knowledge Systems (IKS) in the country. It provides a platform for researchers and professionals working in the field to design the syllabus accordingly.

Curriculum Framework of Undergraduate Programme in IKS

***Programme Level*:** Undergraduate Programme (Level 6 as per NHEQF)

***Programme Name*:** B.A. (Honours/Honours with Research) in Indian Knowledge Systems (IKS)

The B.A. (Honours/Honours with Research) Programme in Indian Knowledge Systems (IKS) is a pioneering academic programme focused on rich Indian philosophy, science, arts, and traditions. Grounded in line with NEP--2020 and other prescribed qualification frameworks, the Programme offers learners a unique opportunity to explore insights embedded in India's ancient knowledge systems. Through a blend of interdisciplinary learning, theoretical understanding, and practical applications, learners embark on a transformative journey of understanding Indian knowledge traditions.

Learning Objectives of the Programme

The Programme in Indian Knowledge Systems (IKS) has the following objectives:

- To provide learners with a comprehensive and detailed understanding of Indian Knowledge Systems, including philosophy, science, arts, and traditions.
- To develop critical and analytical skills by studying Indian philosophy, science, and arts.
- To foster interdisciplinary learning and research in the context of ancient knowledge traditions.
- To prepare learners for advanced and further studies or careers that require an in-depth understanding of Indian Knowledge Systems.

Learning Outcomes

Based on the aforementioned objectives, the expected learning outcomes in programme in Indian Knowledge Systems (IKS) are mentioned below:

- The learners will gain a deeper understanding of core concepts and principles of Indian Knowledge Systems.
- The learners will develop critical thinking and analytical skills through engagement with primary texts and scholarly interpretations.
- The learners will apply the principles of Indian Knowledge Systems to contemporary issues and challenges.
- The learners will be able to pursue further studies or careers that require an in-depth understanding of Indian knowledge traditions.

Eligibility

The model programme has been designed in order to be feasible for learners of all streams, considering the multidisciplinary nature of the subject matter. The prospective learners must have passed 10+2 or equivalent examination in any stream from a recognized Board in India.

Medium of Instruction

The medium of instruction for the Programme in IKS is recommended as Hindi or any other language approved for instruction in India.

Teaching-Learning Process

The teaching-learning methods of the Programme are diverse and engaging, encompassing traditional and modern learning process approaches. Lectures form the backbone of theoretical learning, providing a comprehensive perceptive of the historical context and philosophical underpinnings of IKS. Focused group discussions are integral to the learning process for encouraging critical thinking, and fostering a deeper appreciation of IKS principles. A blend of audio-video resources and excursions to historical sites and cultural centers may be applied to present complex concepts and provide a tangible connection to the subject matter. Practical sessions may also be organized for first-hand training on subject matter aspects for learners. These varied teaching-learning methods should be aimed at preserving and reviving the diverse knowledge traditions of India, ensuring their relevance and vitality in the modern world (Guidelines for Innovative Pedagogical Approaches & Evaluation Reforms, University Grant Commission).

Table 1: Classification of Courses in the Undergraduate Programme (B. A. Honours/Honours with Research) as per UGC Regulations

S. No.	Nature of the Course	Course Code	Description of the Course
1.	Discipline Specific Course	DSC	These are the foundational Courses, which are to be compulsorily studied by a learner as a core requirement to complete the program in a discipline of study at the UG level. These also include the introductory Course on research methodology, dissertation writing, project work, fieldwork, lab work, Indian knowledge systems, skill enhancement, value addition, etc., related to the subject.
2.	Discipline Specific Electives	DSE	These are the elective Courses aimed at specializing the learner in a particular sub-discipline of the discipline concerned. The learners can choose the Courses from a basket of DBCE offered in the relevant semester.
3.	General Electives	GE	These are the elective Courses aimed to enable exposure to other disciplines or domains. The learners have to choose open elective courses from other departments of the University.
4.	Ability Enhancement Course	AEC	AEC courses are based on content that enhance knowledge in various study areas. Language and Literature, Environmental Science, Sustainable Development, and other Courses as recommended by specific University will be mandatory for all disciplines.
5.	Skill Enhancement Course	SEC	SEC courses are skill-based in all disciplines and aim to provide learners with hands-on training, competencies, proficiency, and skills. SEC courses may be chosen from a pool designed to provide skill-based instruction. Every discipline may provide skill-based courses, some of which may be offered to learners of their discipline, while the rest can be open to learners of all other disciplines.
6.	Value Addition Course	VAC	VAC courses are a shared pool of courses offered by different disciplines and aimed towards personality building, embedding ethical, cultural, and constitutional values; promoting critical thinking, Indian Knowledge Systems, scientific temperament, communication skills, creative writing, presentation skills, sports. Physical education and teamwork will help in the all-round development of learners.
7.	Indian Language	IL	Pool of Indian Languages in the eighth schedule of the Constitution
8.	IAPC	IAPC	Internship/Apprenticeship/Project/Community Outreach
9.	Cr.	Credits	Credits are allotted to each Course as per the Credit System

Table—1: Model Programme Structure and Curriculum for BA Programme on IKS

Nature of Course	Course Code	Name of Course	Cr.	Course Code	Name of Course	Cr.
	Semester I			**Semester II**		
DSC	UIKS6001	Bhaarateeya Gyaan Pranaalee ka Parichay	4	UIKS6004	Samanya Vaidik Ganit	4
	UIKS6002	Aaryaavart ka Itihaas	4	UIKS6005	Samanya Vigyaan	4
	UIKS6003	Saamaanya Sanskrit	4	UIKS6006	Bhaarateeya Saamaajik Vyavastha	4
GE	GE 1	Saamaanya Vaikalpik Paathyakram 1 (Anya Vishayon se)	4	GE 2	Samanya Vaikalpik Paathyakram 2 (Anya Vishayon se)	4
AEC	AIKS6001	Sambandhit Vishvavidyaalaya/ Sansthaan ke Anusaar	2	AIKS6002	Sambandhit Vishvavidyaalay/Sansthaan ke Anusaar	2
SEC	SIKS6001	Aayurved	2	SIKS6002	Aadhyaatmik Chikitsa	2
VAC	VIKS6001	Rishi Parampara	2	VIKS6002	Sanaatan Dharm	2
	Semester III			**Semester IV**		
DSC	UIKS6007	Bhaarateeya Arthashaastr	4	UIKS6010	Sandhaaraneey Vikaas Hetu Paryaavaran	4
	UIKS6008	Bhaarateeya Raajaneetik Vyavastha	4	UIKS6011	Bhaarateeya Bhoogol Shaastr	4
	UIKS6009	Bhaarateeya Lok Prashaasan Vyavastha	4	UIKS6012	Bhaarateeya Khagol Vigyaan	4
DSE	UIKS6021	Praacheen Bhaarateey kootaneeti Evam Antararaashtriy Sambandh	4	UIKS6022	Bhaarateeya Vigyaan, Abhiyaantrikee Evam Takaneek (Ateet, Vartamaan Evan Bhavishy)	4
AEC	AIKS6003	Sambandhit Vishwavidyalaya/ Sansthaan ke Anusaar	2	AIKS6004	Sambandhit Vishvavidyaalaya/ Sansthaan ke Anusaar	2
SEC	SIKS6003	Sandhaaraneey Krishi Evam khaady Sanrakshan	2	SIKS6004	Bhaarateeya Saundarya Shaastra	2
VAC	VIKS6003	Bhaarateeya Anushthaan Evam Parv	2	VIKS6004	Yog Vidya	2
	Semester V			**Semester VI**		
DSC	UIKS6013	Bhaarateeya Nyaay Pranaalee	4	UIKS6016	Bhaarateeya Shikshan Pranaalee - gurukul Parampara /Vidyaapeeth	4
	UIKS6014	Bhaarateeya Prabandhan	4	UIKS6017	Bhaarateeya Svaasthy Vigyaan	4
	UIKS6015	Bhaarateeya Darshan	4	UIKS6018	Bhaarateeya Gyaan Parampara Mein Vyaktitv Vikaas kee Pranaaliyaan	4

Nature of Course	Course Code	Name of Course	Cr.	Course Code	Name of Course	Cr.
DSE	UIKS6023	Kaavy Evam Puraan	4	UIKS6024	Shodh Pravidhi	4
GE	GE 3	Saamaany Vaikalpik Paathyakram 3 (Anya Vishayon se)	4	GE 4	Samanya Vaikalpik Paathyakram 4 (Anya Vishayon se)	4
SEC	SIKS6005	Bhaarateey Gyaan Pranaalee Mein Manovigyaan Evam Chetana ke Vikaas ke Vibhinn Upaagam	2	SIKS6006	Vyaakaran	2
	Semester VII			**Semester VIII**		
DSC	UIKS6019	Ved Evam Vedaang Jyotish	4	UIKS6020	Dharmashaastra	4
DSE	UIKS6025	Upanishad	4	UIKS6028	Vaastushaastra	4
	UIKS6026	Bhaarateeya Sainya Vigyaan	4	UIKS6029	Naatyashaastra	4
	UIKS6027	Jyotish	4	UIKS6030	Sahitya-Abhigyan Shakuntalam, Meghdoot, Mrichakatikam, Mudrarakshas, Uttarramcharitam, Swaapnawasvadattam, Kiratarjuneeyam	4
IACP	UIKS6091	Laghu Shodh Prabandh	6	UIKS6092	Laghu Shodh Prabandh	6

Source: Author

Assessment and Evaluation

Evaluation and assessment of learning outcomes in the Programme should be achieved through various techniques, ensuring a comprehensive perspective and applications of the concepts. Continuous and comprehensive evaluation should be implemented to assess and evaluate learning outcomes. Research projects and other analytical assessments will be helpful to learners, allowing learners to delve deeply into specific aspects of IKS and demonstrate their research and analytical skills.

Incorporating these varied assessment methodologies, based on learning outcomes, there should be a focus on ensuring a comprehensive evaluation of learners' understanding and applications of Indian Knowledge Systems. However, the guidelines issued by particular universities as recommended by the Board of Studies (BoS), School Board, and Academic Council and statutory policies as prescribed by the University Grant Commission should be followed strictly (Guidelines for Innovative Pedagogical Approaches & Evaluation Reforms, University Grant Commission). Classification of Courses in the Undergraduate Programme (B. A. (Honours/Honours with Research) as per UGC Regulations is given in Table 1.

Model Programme Structure and Curriculum

The Programme is spread over four years (eight semesters) and covers different courses of varying nature and characteristics. The curriculum structure is designed in accordance with 'National Educational Policy (NEP) 2020 as per policies of 'The National Skills Qualifications Framework (NSQF)', National Higher Education Qualifications Framework (NHEQF),' 'National Credit Framework (NCrF),' 'Curriculum and Credit Framework for Undergraduate Programmes,' along with other standards set up by institutions of national and international repute. Table 1 depicts the model course curriculum prepared by the author for the Programme.

Note

1. The Dissertation, Academic Project/ Entrepreneurship, will start in the VII Semester and continue in the VIII Semester. However, the evaluation and assessment will be done in the VII Semester as well VIII Semester.
2. Learners studying DSEs offered by any Discipline other than the learner's Core Discipline will be treated as GE for the learner.
3. In four years, a learner will study the following number of DSCs, DSEs, and GEs: Total DSC papers: 20

   Total DSE paper options: 10 (minimum to be chosen is 4)

   Total GE paper options: 10 (minimum to be chosen is 4)
4. In a single core discipline program, the learner shall Major in the core discipline. However, if the learner wishes to do a Minor in another discipline, then the learner has to earn 28 credits from GE courses in the second discipline.

   The learner can do a Minor in another discipline if he/she fulfills the following criteria: Seven GEs = Minor (7 x 4) = 28 credits.
5. On Exit after the First Year, the Learners will be awarded an Undergraduate Certificate in IKS.
6. On Exit after Two Years, the Learners will be awarded an Undergraduate Diploma in IKS.
7. On Exit after Three Years, the Learners will be awarded a B. A. (Honours) in IKS.
8. On Exit after Four Years, the Learners will be awarded a B. A. (Honours with Research) in IKS.

Career Prospects

Successful learners of the Programmes in Indian Knowledge Systems (IKS) can pursue various career paths in traditional and modern fields. Some potential career opportunities include:

1. Learners may pursue research positions in academic institutions, think tanks or research organizations focusing on Indian knowledge systems.
2. Learners may become teachers or professors in schools, colleges, or universities specializing in Indian Knowledge Systems.
3. Learners may work in cultural organizations, museums, or heritage sites to preserve and promote Indian Knowledge Systems and Traditions.
4. Learners may work in government agencies, NGOs, or advocacy groups to promote policies that preserve and promote Indian Knowledge Systems.
5. Learners may work in publishing houses, media organizations, or digital platforms to create content related to Indian Knowledge Systems.
6. Learners may start businesses related to Indian Knowledge Systems, such as wellness centers, cultural tourism ventures, or educational platforms.
7. Learners may work as consultants, providing expertise on Indian Knowledge Systems to businesses, organizations, or government agencies.
8. Learners may work in the social sector, using their knowledge to address social issues and promote holistic well-being in communities.

Conclusion

Salvaging and reviving the Indian Knowledge Systems is not just a matter of preserving ancient texts and traditions but reclaiming our cultural heritage and pride. By honoring the wisdom of our ancestors and integrating traditional knowledge into contemporary society, we can ensure that India's rich intellectual legacy continues to inspire and enrich future generations. Incorporating Indian Knowledge Systems (IKS) into the education curriculum at all levels is crucial for preserving and promoting Indian languages, arts, and culture. The paper underscores the importance of a new programme at the undergraduate level in higher educational institutions to revive IKS. By reviving and preserving IKS, India can reclaim its lost cultural heritage and pride while fostering a more holistic and inclusive approach to education.

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Artificial Intelligence at the Crossroads: Some Ethical Considerations

Manoj Kumar Saxena* and Vikram Bajotra**

Artificial Intelligence ((AI)) is growing at a rapid pace, and the recent advancements in generative AI in particular have raised both enthusiasm and concerns. Artificial intelligence is becoming more and more ingrained in our daily lives, often in ways we are unaware of. Artificial intelligence is currently used in the creation of anything from self-driving cars to smart home appliances, medical diagnostics, and news anchors. Businesses, educational institutions, and tech corporations face a variety of ethical conundrums when it comes to AI research and development; many of these questions are still open and require further investigation. Furthermore, extensive public use and application of AI systems raises new ethical concerns. To fully profit from AI systems, we must first trust them and ensure that they adhere to the same ethical standards, moral ideals, professional codes, and social reforms as humans. Artificial intelligence (AI) is quickly progressing, generating serious ethical concerns about its widespread applications. Because AI-based choices are prone to mistakes, discriminatory consequences, and entrenched bias, it is critical to address the ethical concerns involved with their widespread adoption. With its rapid advancement, artificial intelligence (AI) is giving rise to serious ethical questions about its application, ownership, accountability, and long-term effects on humankind. This paper attempts to look into the critical ethical issues that must be solved before AI fully dominates our world.

Artificial Intelligence: A Concept

Artificial intelligence, commonly known as AI, is an innovative technology that makes it possible for machines to carry out jobs that normally demand human intelligence. Artificial intelligence (AI) is changing how we live and work, from driving self-driving cars and virtual assistants to transforming healthcare and banking. AI systems can solve complicated issues, automate procedures, and make predictions by sifting through enormous volumes of data and identifying connections. Artificial Intelligence (AI) has great promise for transforming technology and opening up new avenues for innovation and efficiency across various industries. This involves constructing computer systems accomplished of carrying out processes that usually demand the intellect of humans, like speech recognition, visual perception, decision-making, and language translation. Artificial Intelligence (AI) comprises several subfields, such as robotics, machine learning, and natural language processing. AI is always changing in sync with technological breakthroughs. One important aspect of artificial intelligence is machine learning, which lets robots learn from data and gradually get better at what they do without needing to be explicitly programmed. Artificial intelligence has many potential uses, from financial forecasting and medical diagnostics to driverless cars and virtual assistants. But AI also brings up social and ethical dilemmas, like the loss of jobs, privacy concerns, and the possibility of prejudice in algorithms used to make decisions. Therefore, it is essential to develop and apply AI responsibly to get the most out of its benefits and minimize any potential hazards. To put it briefly, artificial intelligence is the area of computer science that aims to create intelligent computers that are capable of performing activities that would typically need human intelligence. Although there is potential that this field will have a big influence on our lives, at the same time there are also significant concerns that need to be properly thought out.

Introduction

Over the past ten years, artificial intelligence (AI) has developed at an astonishingly fast rate. It is widely used in different industries, including business, manufacturing, logistics, transportation, healthcare, and education. AI applications have improved efficiency and reduced costs, which are advantageous for societal progress, economic expansion, and wellbeing of humans. The artificially intelligent chatbot, for example can reply to customers' questions whenever they arise, increasing both customer satisfaction and business revenue. AI enables physicians to provide telemedicine services

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to patients who are located in remote areas. The deep integration and broad use of AI across many industries have increased productivity and yielded advantages. At the same time, AI raises numerous ethical concerns or risks for users, developers, humans, and society. In 2016, for instance, an electric Tesla car's driver lost his life in an accident when the autopilot failed to recognise an oncoming vehicle (Morby, 2016). The AI from Microsoft conversation bot Tay.ai was taken down less than a day after it started acting racistly on Twitter (Vincent, 2016). Worse yet, criminals are starting to harm individuals or society by utilising AI technology. For example, scammers deployed software based on artificial intelligence to mimic a CEO's voice and demand a $ 243000 illegal payment (Stupp, 2019). There are countless instances of AI systems failing, being unfair or biased, compromising privacy, having security issues, and posing other moral dilemmas. Consequently, the study of ethical problems in artificial intelligence, or AI ethics, has grown in importance as a field of study in academia and as a matter of concern for people, companies, societies, and countries. Therefore, it is imperative that ethical concerns related to AI be addressed in order for AI to be created, implemented, and used properly.

Ethical Considerations in the Adoption of AI

The widespread use of AI presents ethical questions about privacy since sophisticated algorithms might jeopardise people's private data. Furthermore, the possibility of algorithmic bias might lead to discrimination and unfair treatment, exacerbating already-existing socioeconomic disparities. Maintaining openness, responsibility, and impartial design are essential for negotiating the moral terrain of broad AI deployment. The ethical issues related to the general adoption of AI are as discussed here.

Algorithmic Bias and Its Impact on Social Justice

The term "algorithmic bias" describes the unjust and systematic discrimination that can happen when algorithms produce distorted results, frequently confirming pre-existing cultural biases. For example, biased training data in facial recognition systems might result in misidentifications and mistakes, especially for people with darker skin tones. Racial and socioeconomic inequalities can be sustained in the setting of criminal justice algorithms due to biased data and defective algorithms (Wilson, 2023). These biases could lead to different results, disproportionately harming marginalised communities. The impact of algorithmic judgements on vital facets of people's lives, including employment, law enforcement, and service accessibility, raises grave worries about the degradation of social justice. Improving transparency, accountability, and inclusion in algorithmic decision-making processes is crucial in order to address algorithmic bias and promote a just and equitable society.

Discrimination Based on Protected Characteristics

Discrimination against protected traits such as race, gender, and disability in AI-powered a system raises serious ethical concerns. When AI systems are educated on biased data or coded with biased algorithms, they may unintentionally perpetuate or exacerbate societal disparities. Biased recruiting algorithms, for instance, may discriminate against specific demographic groups, exacerbating existing discrepancies in employment chances. This not only violates the values of fairness and justice but also leads to the marginalisation of already disadvantaged communities (Buccella, 2022). Furthermore, biased AI systems may perpetuate preconceptions and undermine attempts to promote diversity and inclusion. Ethical AI needs a commitment to fairness, openness, and responsibility throughout the development process. Addressing these ethical concerns entails rigorous training data analysis, ongoing bias monitoring, and the incorporation of diverse and inclusive approaches into AI system design. Fairness in AI-driven systems is critical for preventing prejudice and fostering a more just and equitable society.

Ethical Considerations of AI in Education

The integration of AI in education holds immense potential for personalized learning, adaptive assessments, and engaging experiences. When AI is included in education, several ethical issues arise that need to be carefully navigated. Data privacy is a major concern because so much sensitive information about pupils is gathered. (Nguyen et al., 2022). A crucial difficulty is finding a balance between protecting individual privacy and using AI for personalized learning. Likewise, addressing concerns of equity is also crucial. To ensure equitable access and advantages for all students, AI tools must be used in a way that does not worsen already-existing educational inequities. Eliminating algorithmic bias is essential in order to stop discrimination and misconceptions from continuing. It becomes critical for AI systems

to be accountable and transparent to preserve trust in educational institutions. Clear ethical standards must be established to control the application of AI to avoid the unforeseen effects of excessive reliance on technology and to maintain the vital human element in education (Adams et al., 2023). Teachers need to be on alert for any biases in AI algorithms and make sure that these technologies complement, not replace, the vital function that human teachers play in the classroom. To fully utilize artificial intelligence (AI) in education and protect the rights, privacy, and educational possibilities of every student, a careful and moral approach is crucial.

The Perpetuation of Existing Societal Biases through AI Systems

The persistence of current social biases by AI systems is a major problem because these technologies inherit and potentially exacerbate the biases found in their training data. If the data used to train AI models reflects historical disparities, the system may unwittingly learn and reinforce those prejudices. Biased hiring practices, historical prejudices, or systematic inequities in data, for example, can all lead to discriminatory consequences, reinforcing social biases. Addressing this issue needs thorough dataset curation, algorithmic transparency, and constant review to discover and correct bias (Randieri, 2023). To avoid perpetuating existing societal biases with these powerful technological tools, ethical AI development approaches must prioritise justice, inclusivity, and the eradication of discriminating tendencies

Fairness and Explainability in AI Decision-making Processes

Fairness and explainability are critical components of AI decision-making procedures that enable openness, accountability, and ethical technology use. Fairness entails avoiding biased results and treating all individuals equally, regardless of their traits. To reduce and correct any biases that may arise, AI requires careful analysis of training data, algorithmic design, and constant monitoring. Explainability, on the other hand, relates to how clear and understandable AI conclusions are. Understanding how AI models arrive at specific conclusions is critical for establishing confidence and holding systems accountable (Zhou et al., 2022). Transparent AI systems allow users to see the reasoning behind decisions, which is especially crucial in sensitive fields like healthcare, finance, and criminal justice. Balancing fairness and explainability necessitates on-going work in algorithmic design, model validation, and the establishment of standardized standards. Striking this balance guarantees that AI systems not only generate just results but also allow users to trust and understand decision-making processes, promoting responsible and ethical AI technology adoption.

The Collection and Use of Personal Data by AI Systems and its Implications for Individual Privacy

AI relies largely on large datasets for training and decision-making, which frequently contain sensitive personal information. The indiscriminate or incorrect treatment of such data might result in privacy violations, potentially exposing persons to unauthorised surveillance or data extraction (Saxena & Singh, 2020). Furthermore, the incorporation of AI into different facets of daily life, ranging from smart devices to internet services, raises worries about on-going data collection. Individual privacy concerns extend beyond data collecting, as AI systems may mistakenly divulge private details or trends about people. Training data biases can provide discriminatory results that disproportionately affect particular populations. To ensure responsible and ethical use of personal information in the era of AI, strong data protection rules, transparent practices, and user permission frameworks are necessary to strike a balance between exploiting data for AI developments and protecting individual privacy (Walch, 2023).

Data Ownership and Control in the Age of AI

The ownership and governance of data is a critical issue because AI systems depend on large volumes of data for training and operation. Insufficient transparency in these aspects may result in the improper handling and abuse of private data (Korte, 2023). To guarantee that people have control over their data, it is important to establish explicit frameworks for data ownership that identify rights and duties. Putting strong data governance, encryption, and access restrictions in place also helps to protect data ownership rights, which improves overall security and privacy in the quickly changing AI technology ecosystem.

The Vulnerability of AI Systems to Hacking and Manipulation

AI systems' vulnerability to hacking and manipulation creates substantial privacy and

security threats. As AI gets more integrated into vital infrastructures and decision-making processes, malicious parties look to exploit vulnerabilities for a variety of reasons. Hacking AI systems can result in outputs being manipulated, biased data being injected, or purposeful errors compromising the integrity of the results. Adversarial assaults can also trick AI algorithms by quietly modifying input data, resulting in inaccurate predictions or judgments (Lunness, 2023). Protecting against such dangers necessitates ongoing monitoring, strong cyber security measures, and the creation of resilient AI systems. Ensuring the security of AI systems entails incorporating encryption, access limits, and regular vulnerability patching updates. A thorough and proactive approach is required to limit the possible effects of AI system breaches while maintaining data integrity and user privacy.

The Potential for AI-powered Surveillance and Its Impact on Individual Liberty

As powerful monitoring technologies, frequently powered by AI, grow increasingly common, there is a risk that human liberties will erode. Mass data collecting, facial recognition, and behavioural tracking can lead to widespread monitoring, jeopardising citizens' right to privacy. The real-time analysis capabilities of AI in surveillance elevate the stakes by allowing for unparalleled examination of individuals' behaviour (Rodrigues, 2020). Striking a balance between public safety and individual liberties is critical, necessitating the development of strong legal frameworks and oversight mechanisms to ensure responsible deployment of AI-powered surveillance technologies and protect individuals' fundamental rights in the digital age.

The Question of Who is Responsible for the Actions of AI Systems

The issues of autonomy and responsibility are central to the debate about who is responsible for AI systems' activities. As AI systems become more autonomous and capable of making their own decisions, it becomes more difficult to define clear lines of accountability (Power, 2023). Traditional conceptions of responsibility may not be compatible with the complex nature of AI algorithms and their changing behaviour. Developers, data scientists, and organisations participating in AI system development all bear some responsibility for the results. Establishing ethical principles, regulatory frameworks, and industry standards is essential for striking a balance between supporting innovations and maintaining accountability. These criteria are critical for holding stakeholders accountable for the design, deployment, and on-going monitoring of AI systems, promoting a culture of responsible AI development and usage (Stahl, 2021).

The Role of Human Oversight and Control Over Autonomous AI Systems

While AI systems demonstrate increasing autonomy, human interaction is still required to monitor, guide, and assist in crucial situations. Human oversight is critical for recognising and reducing biases that may arise in AI decision-making, assuring fairness and ethical use (Safdar et al., 2020). Human control protects against unforeseen outcomes or ethical quandaries in high-risk fields such as healthcare, finance, and autonomous cars (Saxena & Sharma, 2020). Establishing defined frameworks for human-AI collaboration, specifying decision boundaries, and including transparent interfaces might help to improve accountability and ethical behaviours. Striking the correct balance between autonomy and human control is critical to establishing trust in AI technologies, allowing for their responsible integration into society while respecting ethical standards and values.

The Potential for AI to Erode Human Autonomy and Decision-making Capacity

Artificial intelligence (AI) systems are meant to support and enhance decision-making, but they may unintentionally reduce the autonomy of humans. Over-reliance on AI ideas or automation may result in a decline in critical thinking abilities and autonomous judgment (Naik, et. al., 2022). Furthermore, the cloudiness of complicated AI algorithms may lead to users relinquishing decision-making authority without a clear knowledge of how suggestions are created. To address this difficulty, AI system design and deployment must be carefully considered, with a focus on transparency, accountability, and the setting of defined boundaries for AI influence. Ethical frameworks must prioritise human autonomy, ensuring that AI technologies complement, rather than replace, human decision-making capacities.

The Impact of AI on the Future of Work and the Changing Definition of Human Labour

AI's impact on the future of work is substantial, necessitating a rethinking of human employment.

Automation powered by AI technologies has the potential to simplify regular tasks, increasing efficiency and productivity. However, there are concerns regarding job displacement and the necessity to upskill the workforce to adapt to changing technological environments. As AI takes on increasingly regular jobs, the emphasis in the workplace shifts to uniquely human qualities such as creativity, critical thinking, and emotional intelligence. This reframing of human employment necessitates a responsible approach to AI implementation, ensuring that technical improvements accord with society's ideals and promote equitable economic growth (Sheedy, 2023). It also necessitates a commitment to providing education and reskilling opportunities to reduce future job displacement and train the workforce for tasks that require diverse human talents. Striking this balance is critical for reaping the benefits of AI while also minimising its influence on the nature of work and employment.

The Ethical Implications of Job Displacement Due to Automation and AI

Artificial technologies undoubtedly have the potential to increase productivity and creativity, but widespread automation could lead to the loss of human jobs. This raise worries about the livelihoods of people affected and the possibility of economic inequity. The ethical implications include firms' and authorities' responsibilities to support reskilling and upskilling programmes that help displaced workers transfer into new roles (Bankins & Formosa, 2023). Furthermore, the ethical framework should include considerations for social stability, as high unemployment can have far-reaching societal consequences. Striking a balance between the benefits of automation and the ethical treatment of the workforce entails taking proactive steps to prevent negative consequences, guaranteeing a fair and inclusive transition to a future in which AI plays a more important role in the workplace.

The Impact of AI on Access to Essential Services and Resources

The impact of AI on access to critical services and resources is a double-edged sword. On the one hand, artificial intelligence has the potential to increase the efficiency and accessibility of key services like healthcare, education, and public infrastructure. AI-powered technology can optimize resource allocation, improve diagnostic processes, and personalise educational experiences, thereby increasing access. However, concerns have been raised about potential discrepancies in AI adoption among different populations. Socioeconomic issues, technology literacy gaps, and infrastructure differences can all contribute to a digital divide, limiting marginalised communities' access to AI-powered services. To fully realise AI's positive influence on access to key services, regulations that promote inclusivity, address inequities, and prioritise ethical considerations must be implemented. Governments, corporations, and communities must work together to ensure that AI technologies contribute to more fair resource and opportunity distribution (Clark, 2023).

The Development of Artificial Consciousness and its Ethical Implications

Scholars exploring the creation of sophisticated artificial intelligence pose inquiries regarding the essence of consciousness, self-awareness, and the possible ethical standing of digitally created intelligence (Lenharo, 2023). Ethical considerations involve the rights and obligations of entities that may have subjective experiences. Concerns regarding the ethical treatment, rights, and potential exploitation of conscious AI entities run alongside issues about the moral treatment of living beings. The advancement of artificial consciousness also provokes thought about human identity, empathy, and societal ideals. Striking a balance between innovation and ethical stewardship is critical to ensuring that the development of conscious AI adheres to humane principles and respects the sanctity of potential artificial life forms, raising profound existential questions about our relationship with technology and the ethical limits of artificial sentience.

The Potential for Super Intelligence and its Impact on Humanity

The prospect of superintelligence, an AI system that outperforms human intelligence in all areas poses grave worries for humanity. If built without proper protections, a super-intelligent AI could bring enormous threats, potentially surpassing human control and comprehension. The implications for world governance, economic structures, and even humanity's survival become questionable. Ethical concerns arise over super-intelligent AI's alignment with human ideals, as well as the possibility of unforeseen effects (Rotaru & Amariei, 2023). Accountability, transparency, and risk management are essential issues for highly sophisticated AI systems. Ethical considerations must govern the

appropriate development and deployment of such advanced technologies to ensure humanity's future.

The Question of Whether AI Can Ever Be Truly Ethical

The question of whether AI will ever be completely ethical is a complex and ongoing discussion. While AI systems are human-designed and programmed, their ethical behavior is determined by the principles incorporated in their algorithms and the data on which they are trained. Potential biases in training data, the opacity of complicated algorithms, and the difficulties in instilling machines with a thorough understanding of human values all raise ethical problems (Díaz-Rodríguez et al., 2023). AI systems' fundamental lack of consciousness makes it difficult to grasp the complicated ethical considerations that humans face. Furthermore, ethical theories are frequently context-dependent and culturally influenced, making it difficult to construct globally ethical AI. However, current initiatives in the subject of AI ethics seek to provide principles, standards, and procedures for infusing AI with ethical considerations, hence promoting responsible development and implementation. To navigate the complex environment of machine ethics, a multidisciplinary approach must be taken, combining technological, philosophical, and sociological viewpoints (Bloom, 2023).

The Environmental Impact of AI Development and Deployment

The environmental impact of AI research and deployment has become a major existential worry. The computational requirements of training advanced AI models, particularly massive neural networks, necessitate significant processing power and energy usage. This has resulted in an increase in demand for data centres and computer resources, which has a significant carbon footprint. The environmental concerns include the extraction and processing of rare minerals required in the production of AI system hardware components. Furthermore, the quick pace of technological obsolescence in the field of AI may add to electronic waste, which will have an even greater environmental impact (Onpassive, 2023). To address AI's environmental impact, we must prioritise sustainable computing techniques, energy-efficient algorithms, and ethical electrical component disposal and recycling. Striking a balance between technical innovation and environmental sustainability is critical to ensuring that AI development and deployment benefit society while not increasing environmental issues.

Conclusion

There is no question that the usage of AI is becoming more common, with benefits such as enhanced efficiency and service delivery. However, technology also introduces important ethical hazards and obstacles, such as bias and discrimination, privacy and security concerns, and so on. To mitigate these risks, fundamental ethical frameworks and values such as social responsibility, transparency, professional competency, accountability, and user-centeredness must be followed. Engaging with stakeholders, developing clear policies and guidelines, offering staff education, auditing, and testing algorithms, and establishing clear communication routes for user feedback can all help to encourage ethical behaviour and responsible AI use. Ultimately, even though using AI brings with it both opportunities and challenges, it is crucial to proactively address the ethical issues raised by these technologies to make sure that their use is in line with their mission and values and best serves the interests of society at large as well as its users.

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Stepping into 2047 with Good Health and Sound Mind: Making Best Use of Indian Classical Music and *Naad Yoga*

Arun Dubey*

Indian classical and spiritual music has a rich tradition and long history of use in healing and healthy well-being, and it is closely related to *Naad yoga*. These effective practices are based on ancient knowledge and experiences accumulated over thousands of years, which are of great interest today. A holistic understanding of health considers the physical body as a part of the body system, including other subtle energy layers – *koshas* - and corresponding energy structures. This article gives an introduction to the Indian music system in general, with *Raag* as its element, and *Naad Yoga* - as an ancient system of knowledge, which can give a fresh insight into Music Therapy. It has been especially emphasised to comprehend these achievements of the Indian knowledge system from a modern scientific perspective.

We will try to understand how spiritual sounds or *Mantras* work and what scientific facts lie at their basis; along with frequencies and their effects on the human body and mind. What are the benefits and the uniqueness of Indian classical and spiritual music and therefore, how it can be used in healing and maintaining a healthy well-being?

This article is based on the teaching content delivered by the author during his Indian Council of Cultural Relations (ICCR) sponsored fellowship tenure in Russia in the classes of *Naad Yoga* and Indian Classical Vocal Music. The research work of the author being conducted at RMT Kala Sangeet University (Vishwavidyalaya), Gwalior is also on the topic: "Musical, *Naad, Mantra*, *Stuti* and their effects on Human Body, Mind and Soul". The author hopes, that this article will inspire talented scholars to take up further studies to find new methods of healing and a healthy lifestyle.

The main aim of this study is to extract a small but significant component of the immensely rich ancient Indian traditional knowledge regarding musical therapy and introduce it to the Readers. This knowledge was hidden for a long time and transmitted only through musical family generations and that too from the teacher to the disciple. On the other side, it was counted as non-scientific by the scientific society probably because of a lack of understanding and the absence of research evidence.

It is said that everything, that is new, is already forgotten knowledge of the past. Nowadays scientists search for inspiration in ancient holistic knowledge, and therefore they are in the process of unearthing, rediscovering, and reinventing the research that already existed in our ancient Indian scriptures thousands of years ago. Most of them are adapting the components of traditional knowledge through modern methods and taking credit for themselves as original discoverers and inventors.

Health and Ancient Doctrine of *Naad Yoga*

According to the World Health Organization, health is "a state of complete physical, mental, and social well-being"[1]. In the Indian tradition of Yoga, "health comprises of physical, mental, social, vocational, moral, emotional and spiritual dimensions"[2]. The very word "*Yoga*" came from the Sanskrit word "*yoke*", which means union – the union of body, mind, and soul for health and wellbeing.

Concept of *Panchkosh* or Five Bodies

According to ancient knowledge, the human body is not only what we can see with our eyes. There are five "bodies", and the physical body is only one among them. Other "bodies" are so-called "subtle bodies", which cover the soul as we can see on the Russian Matryoshka souvenir toy (Fig.1).

Five "bodies" are[3]:

- Physical (*Annamaya kosh*) – we can feel it with our five senses;
- Energetic (*Pranamaya kosh*) – Aura and energy movement (Prana);
- Mind (*Manomaya kosh*) – thoughts, emotions, feelings, fears etc;
- Higher Mind/Wisdom – inner consciousness, inner voice, belief systems, intellect, values;

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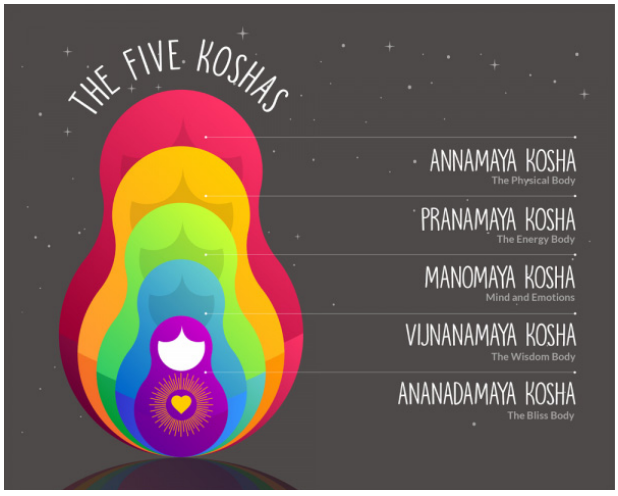
Fig. 1 The five koshas



- Bliss (*Anandamaya kosh)* - the thinnest "body", which is composed of happiness – happiness without any cause. It is associated with the state of dreamless sleep and self-realization.

According to this holistic view, any illness or disorder comes from the subtler "bodies" down to the solid physical body. This knowledge finds proven in modern psychosomatic research. We hear from childhood that "by word we can kill or heal"; and that "all diseases originate from stress".

Our different "bodies" or layers can be affected by different means – the subtler layers can be affected by subtler means and our physical body which consists of five elements, can be treated with the same solid means (medical treatment, chemical therapy, etc.).

Naad Yoga: The Concept

The Sanskrit word *Naad* denotes the ultra-soothing feeling of resonance created by all kinds of sounds or vibrations ---- subtle/tacit and obvious/ explicit happening inside the universe including one's own body. It is the energy of vibrations, so-called *cosmic sound*'. *Naad* is continuous flow of energy, which never stops, like time (it is everywhere - in the human body, in nature, in the universe). The Present research concentrates on a particular field of Yoga ie., *Naad Yoga*. *Naad Yoga* is the union of body, mind, and soul through resonance.

Everywhere there are energies of so many types. To utilize them for life we need to charge them like we charge our electrical and electronic gadgets. Charging electrical and electronic gadgets requires three things viz. the gadget, the lead with a suitable adapter, and the supply/source of energy. To charge ourselves we should know the System, and how it works, and master the art of connecting with the energy flows. Everything, that never ends like the cosmos, has some supportive vibration, and every flowing movement requires some 'vehicle'. For *Naad* that 'vehicle' is sound. The sound is everywhere, it accompanies every process, and it is the first element of nature. Behind every structure, there is some energy and vibration which gets revealed as three in one: word – image – vibration/energy. According to *Vedas,*[4] this structure is described in terms:

1. *Akshar Brahman*[5] – words/alphabets;
2. *Rup Brahman* – visible form;
3. *Naad* – vibration.

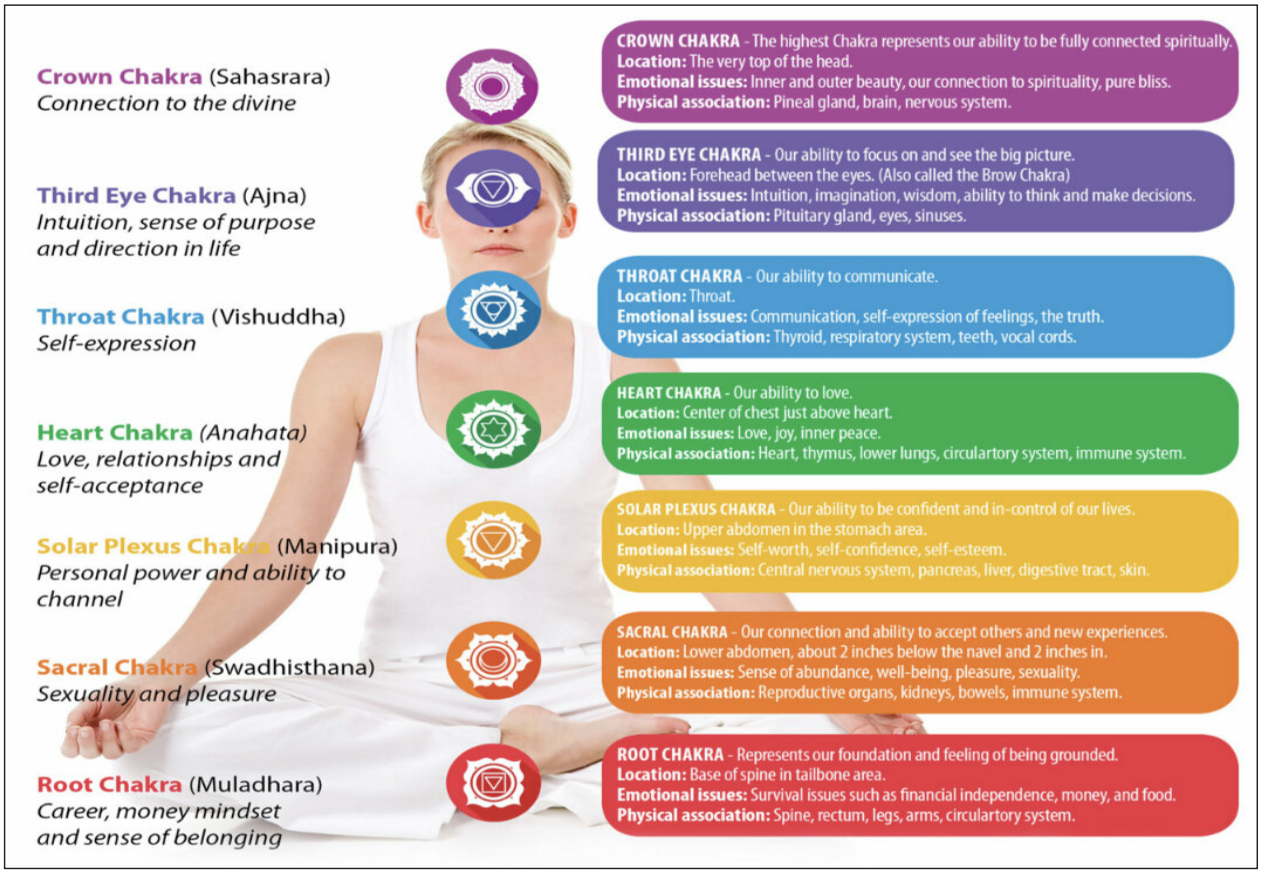
How can we feel this? We say any word - for example "MAMA". Immediately with this word some image comes to our mind, and we also feel some energy vibration. If that connection with the energy flow has happened and it is continuing in the body for some time – that is *Naad.*

The frequency of sound that is audible (speech, singing, etc.), is called *Aahat Naad.* This sound is created by some strokes. The frequency which is not audible is called Anahat *Naad,* it is not created by any stroke. Though we can't hear the *Anahat Naad,* it influences our subtle 'bodies' – our energy layer, and our mind. This *Naad* "journey" which starts with *Akar Brahman* (with form) flows into *Nirakar Brahman*, (formless void).

Five Elements Concept or Panchbhoot

The human body being a part of nature consists of five elements of nature: Earth, Water, Fire, Air, and Ether, collectively called as *Panchabhoot*. The first four elements can be seen through the naked eye and they are: firstly, the Earth Element *(Prithvi)* represented by the food we eat which gives mass and shape to our body; secondly, Water Element *(Jal)* that constitute our inner fluids; the third element is Fire *(Agni)* in our body that facilitates digestion (breakdown of large insoluble food molecules into small water-soluble food molecules); fourth element is Air (*Vayu*) that we require air for breathing. What is fifth element? It is called 'Ether Element' and is constituted of inaudible sound energy representing the invisible, transcendent force that permeates all things, connects everything, and transcends physical limitations.

Fig.2 Seven Chakras and Seven Levels of Consciousness



According to this knowledge of energy system of the human body, each emotion or feeling is located at the particular point. Any disbalance in these main energetic points will lead to some kind of disease. Some western scientists and psychotherapists have already started to use this knowledge in practice (for example, vegetotherapy or body-oriented psychotherapy, based on Wilhelm Reich researches, successfully uses this). [2, 3]

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Energy System of the Human Body and Chakras

At schools we study anatomy, and we know that there are different systems in our body: digestive, lymphatic, circulatory, respiratory, nervous and other systems. There is also another one system in our body, which we do not study at school because it is very subtle – that is energetic system. It also has its structure and laws. Similar to nerves or veins, energy movement in the body goes through some channels, and the places, where bigger channels join, form some kind of nodes. In human body there are 7 big energetic points, which in scriptures of Yoga calls "chakras" (Fig.2). Literally *chakra*[6] means "the wheel", and they are described as spinning disks of energy, which correspond to bundles of nerves, organs and areas of energetic body that affect our emotional and physical well-being. [1]

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Indian Musical System. *RAAG*

Now the question is there – is any kind of music and any kind of singing equally effective on human body? To understand this, we need to appeal to the musical science.

In Indian musical tradition there is a different note system. Each note has a name and some image behind. Each note will affect some particular part of the body. Some set of notes, placed in a typical order, in which they appear in melodies, and characteristic musical motifs form the raag. *Raag* is "a central feature of the classical Indian music tradition, and being very unique, it has no direct translation to concepts in classical western music. In Sanskrit, raag can be translated as "something that colors your mind", for it has the power to create very specific emotions or moods in one's mind"[7]. Thousands of *raagas* are known, but there are six base *raagas,* out of which all others come. For any kind of emotion there is some special raag, there are male and female *raagas*, and some *raagas* are associated with a particular time of the day or of the year. *Raag* involves several important elements:

1. *Naad* – sound vibration, manifestation of the ether energy;
2. *Pitch,* relegated into *Swar* (whole or half tone/ note) and *Sruti* (microtones);
3. *Ras* – emotional effects in the performer and listener, "aesthetic delight". A performer with sufficient knowledge and training can create the desired moods and emotions through the combination of shrutis and *swars*. There are nine rasas:
   - *Wonder (Adbhut),*
   - *Love (Shringar),*
   - *Heroism (Veer),*
   - *Disgust, grotesque (Veebhatsa),*
   - *Anger (Rudra),*
   - *Humour (Hasya),*
   - *Terror* (*Bhayanak),*
   - *Pathos, tragic* (*Karuna)*,
   - *Compassion, peace* (*Shanta)*
4. *Thaat* – scale;
5. *Taal* – rhyme and speed

Raag is based on the principle of a combination of notes selected out the 22 note intervals of the octave. There are 72 *melas* or parent scales, on which *raagas* are based. Improvisation is an essential feature of Indian music, depending upon the imagination and the creativity of an artist. A great artist can communicate and instill in his listener the mood of the *Raaga.*

Every *raaga* must have at least five notes, starting at Sa, one principal note *Vadi,* compared with a 'King', a second important note ('Queen') and a few helping notes. The ascent and descent of the notes in every *raaga* is very important. Some *raagas* in the same scale differ in ascent and descent.

All raags are perfectly balanced, all have healing effect and all have deep meaning behind. It is the art of calling and using some healing energy. By *raag* the whole energy system and *pranic* body are affected. [4]

Mantra Healing by Spiritual Sound

We can say that Raag is the classical instrument of Indian musical therapy, but not the only one. In Indian tradition sound healing is also associated with another term, which is Mantra. [5]

Mantra (in Sanskrit '*manas*' = mind, '*tra'* = tool) is 'a sound, word or phrase in Sanskrit, that alters consciousness through meaning, tone, rhyme or physical vibration"[8]. It is considered to be "tool of thought", used as a means of harnessing and focusing the mind. *Mantra* can be recited in repetitions or chanted with melody.

Each mantra has a meaning behind it, unique vibrational frequency and distinctive healing effects. When chanting a *mantra,* the individual begins to vibrate within the frequency of that mantra even on physical level. When chanting *mantras* aloud, the vibrations and movements of the tongue stimulate some of the key glands of the endocrine system, which are responsible for governing and regulating hormones in the body.

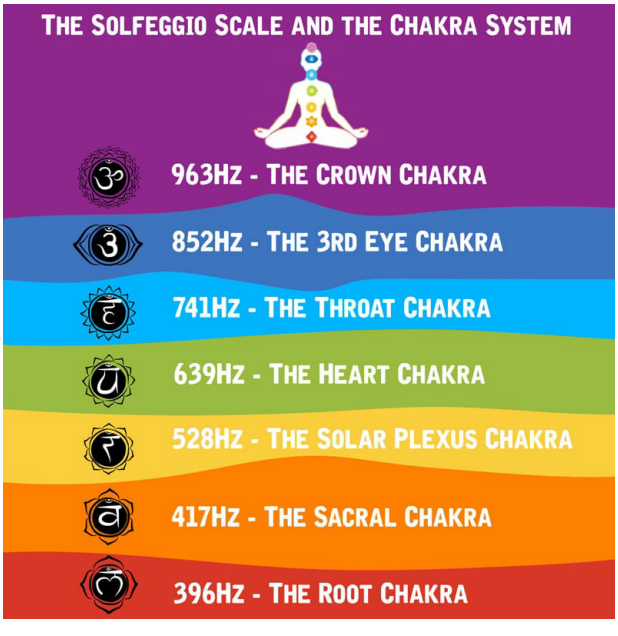
Additionally, the soothing and harmonious combination of sound, breath and rhythm – an inevitable outcome of *mantra* chanting – has a profound impact on the parasympathetic nervous system. This, in turn, slows the heart rate and triggers the body's healing response. [6]

Connection of Mantras and Chakras

As mentioned earlier, there are seven *Chakras* (energetic centers) in the body and there are seven notes (and seven colors of rainbow too). Each *chakra,* according to Yoga science, has its own color and a special *mantra* – so-called "*Beej-Mantra*" (In sanskrit '*beej' is* seed), which is a simple single syllable word, that can be chanted alone or attached to a longer *mantra* to enhance its power and quality. The best known *beej-mantra* is *Om (Or Aum*). There is a special healing practice, which is based on singing *beej-mantras* of chakras on the frequencies of notes. To understand how it works, we have to turn our gaze on some special frequencies of musical notes, which magically correspond to the frequencies of chakras. By correcting the note, we balance the associated chakra and it changes our emotions and mood.

Music is a type of harmonious sound, and sound is a form of energy. Because of its high vibration frequency, we can state that it is a form of positive energy, and everything that resonates with the same vibration, increases its positive energy. Healing components of the Solfeggio frequencies were used long ago in Indian Sanskrit chants. Ancient Indian Yogis referred to some frequency around the Earth as *OuM* the (equal to 7.83Hz). Ivonin & Chang's study defines the relationship between the archetypal sounds, OuM and Solfeggio frequencies and concludes that archetypal sounds are effective in inducing states of meditation and their powerful effect on our subconscious mind and spirit [7]. As depicted in figure 3, each chakra has its own special frequency.

Fig.3 Chakras and their Frequencies



Frequencies of Notes and its Effects on Human Mind and Body

David Hulse, a famous sound therapist, in his work on "Soma-Energetics" described the effects of some frequencies on human body and mind:

UT – 396 Hz - turning grief into joy, liberating guilt and fear by bringing down defense mechanisms. Associated with Root Chakra Muladhara.

RE – 417 Hz - undoing situations, cleanses traumatic experiences and clears destructive influences of past events, puts in touch with an inexhaustible source of energy that allows to change the life. Associated with Sacral Chakra Swadhisthan.

MI – ***528 Hz*** - transformation, returns human DNA to its original, perfect state, increases amount of life energy, clarity of mind, awareness, awakened or activated creativity. Tone Mi activates imagination, intention and intuition. Associated with Solar Plexus Chakra Manipura.

FA – ***639 Hz*** - re-connecting with family and balancing, relationships, enhances communication, understanding, tolerance and love. Associated with Heart Chakra Anahata.

SOL – ***741 Hz*** - solving problems, cleans the cell from toxins, gives power of self-expression, which results in a pure and stable life. Associated with Throat Chakra Vishuddhi.

LA – ***852 Hz*** - awakening intuition, returning to spiritual order, raises awareness. Associated with Third Eye Chakra Ajna. [8]

Dr. Horowitz continued that research and added some more healing frequencies:

SI – ***963 Hz*** - awakens any system to its original, perfect state, re-connects the individual with the Spirit, enables one to experience Oneness – our true nature. Associated with Crown Chakra Sahasrara.

174 Hz - appears to be a natural anesthetic, tends to reduce pain physically and emotionally.

285 Hz - helps return tissue to its original blueprint or form, influences energy fields, sending them a message to restructure damaged organs, makes the body rejuvenated and energized [9].

In 1988, Dr. Glen Rein[9] a popular Biochemist tested the impact of different music on human DNA and proved that Sanskrit chants have the most positive healing effects.

Systems of A-440 Hz and A-432 Hz

The Twelve-Tone Equal Temperament System has been the most common tuning system in use for the past 200 years. It divides the octave into 12 equally spaced parts or 12 equal semitones and states musical intervals in cents, where 100¢ is defined as one equal tempered semitone. This system has been tuned relative to a standard pitch of "A" being - 440 Hertz. All the other notes are tuned in standard mathematical ratios leading to and from 440 Hz. Due to this standard, a piano in Moscow sounds the same as a piano in Delhi.

Though, in the past, a variety of musical tunings were used. A-432 was frequently used by classical composers and the original Stradivarius' were designed to tune to A-432. Many music therapists and musicians claim that a more "natural" frequency for middle "A" is 432 Hz (also known as Verdi's A) because it is in relationship to the "Golden Ratio" [9].

A recent double-blind study from Italy showed that music tuned to 432 Hz slows down the heart rate and reduces blood pressure (both systolic and diastolic) when compared to 440 Hz. This frequency fills the mind with feelings of peace and well-being, making it the perfect accompaniment for yoga, gentle exercise, meditation, or sleep [10].

Frequencies of Indian Notes

In Indian music system, notes are not fixed. A musician can choose the base note (*Sa*) according to his convenience on any frequency, and from this base note whole octave will start. In Indian music system there is also a special term – *shruti,* which means a minor tone. There are 22 *shrutis*, and practically in different *raagas* one and same note may have different shades or flavors. Due to this reason, we can find only approximate frequency of Indian notes as given in Table 1[10], and that too, these frequencies will match, if *Sa* – the basic note – will be set on C-note frequency. For example, if we set our *Sa*-note on A, then all notes' frequencies of our octave will change accordingly[11].

Table 1. Frequencies of Western and Indian Notes

Western Notes	Indian Notes	Frequency Range
A	Dha	215.5-226.5
A#	ni	226.6-239.9
B	Ni	240.0-252.5
C	Sa	252.6-269.5
C#	re	269.6-285.3
D	Re	285.4-302.3
D#	ga	302.4-320.3
E	Ga	320.4-339.3
F	Ma	339.4-359.4
F#	ma	359.5-380.9
G	Pa	381.0-403.5
G#	dha	403.6-427.5

Indian Classical and Spiritual Music as A Healing Instrument

Indian music gives much freedom and space to be used as a therapeutic instrument for emotional regulation and healing. Knowing healing frequencies, we can set the base note Sa; knowing the *Vadi* (principle, "king" note) of *Raaga,* we can understand, which chakra it will affect mostly. In recent studies Indian researchers proved that music therapy based on Indian Classical Music and practice of Naad yoga decrease the level of depression and reduce the level of mental disorders. [12]

Indian scholars G. Saraswati and S. Mohan studied the effect of Indian music at genetic, cellular and neurophysiological level. In their article they state: "Our brain responds to music by releasing serotonins (a monoamine neurotransmitter), which contributes to the feeling of well-being and happiness. Listening to music also releases mood enhancing chemicals like dopamine, melatonin and endorphins. Music may also boost an endocannabinoid anandamide (the molecule of bliss), body's own antidepressant. … Music not only affects our brain, but also our DNA and cells. … Our endocrine gland system is interestingly very much responsive to the

vibration of musical notes. In fact, our body functions harmoniously as the orchestration of the endocrine system. … We conclude that, music therapy offers an effective alternative for regenerative biology and can be used for regeneration of stem cells in vitro or in our body." [13].

In the same research work the frequency of vibrations of the spectrum of emotions was provided, which is given in[11] (Fig.2). We see that the flow of energy and frequency of vibration increases from the bottom up. The scientists state that "the first musical note Sa has a frequency of 262 Hz and so on; thereby it helps the listener/practitioner to resonate with the corresponding high vibration emotion in the spectrum". Other than pleasure, the effects of music increase in high vibration emotions like joy, peace, etc., and reduce the low vibration emotions like anxiety, fear, anger etc. [13].

Fig.2 Spectrum of Emotions with Related Frequencies

G. Saraswati and S. Mohan declare: "In our observations of behavioural psychology, regular practitioners of music show an observable positive qualitative difference in comparison to non-practitioners. They are less stressed, their anxiety levels are low, more clam and more grounded. Children, who listen to or practice music regularly, have found have better learning, memory and concentration, less aggression and better anger and stress management in comparison to the ones, who don't. Neurophysiology study shows their brain to be in Alpha (relaxed) state with slower and deeper breathing, better heart rate and parasympathetic predominance. They are spiritually more advanced than other beings as they vibrate higher. Music has also been seen to improve quality of life in healthy individuals" [13].

Conclusions

Indian classical and spiritual music of any level, setting notes*(alankars),* chanting *mantras,* and singing *ragas* is a pleasurable practice of harmonizing mind, body, and soul. It evidently gives many benefits such as:

Self-regulation: by singing we control breathing, by note practice (*alankars*) we control the mind and give good exercise for our cognitive system;

Energy Charging: by proper note, we turn the energy in *chakra* (every chakra is like a lock, and proper note is a key);

Energy Balancing: by practicing *raag* we learn to call some specific good energy, we balance our energy, aura;

Self-expression: by singing we express all inner emotions (we don't keep them inside, so they don't accumulate and create illness);

Spiritual Growth: by devotional singing we concentrate our minds on the higher forms of spirituality. It's a beautiful and blissful path of spiritual growth;

Creating Healthy Atmosphere: by listening of *raagas* we can change our mood into positive one and uplift our energy level, etc.

Thus, Indian classical and spiritual music is a deep healing and uplifting spiritual science; a kind of Yoga, which if practiced by everyone in the country, will make India will be the healthiest nation in the years to come. Instead of getting labelled as Diabetic Capital or Cancer Capital, it can be get *branded as Health Capital of the World*. This is also in line with the objectives laid down by our Hon'ble Prime Minister for creating *Viksit Bharat*. Let our citizen enter 2047 with good health and sound mind! Let's make best use of our Bhartiya Knowledge!

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❑

Working for a *Viksit Bharat*

Pramod Kumar Mishra, Principal Secretary to the Hon'ble Prime Minister of India delivered the Convocation Address at the 19th Convocation Ceremony of the Indira Gandhi Institute of Development Research, Mumbai on January 04, 2024. He said, "Whether you pursue careers in academia, government, or the private sector, you can contribute to the common good by applying your skills and insights to the complex problems of our time. I urge you to use your talents and passions to make a positive difference in the world." Excerpts

The Indira Gandhi Institute of Development Research (IGIDR), during the last few decades of its existence, has emerged as an influential centre of research and teaching in a wide range of development issues. It is one of the few centres of higher learning that focuses on teaching and research from an inter-disciplinary perspective.

Its academic programmes lay emphasis on combining theory with hands- on experience. The two journals: *Journal of Quantitative Economics,* and *Macro Economics and Finance in Emerging Market Economies*, are very well respected in the country and outside.

My dear students, I congratulate all of you who have received MSc, MPhil, and PhD degrees and awards today. This is an important milestone in your life, which you would undoubtedly cherish and celebrate. However, you must look to the future, to the accomplishment of many such milestones.

Also remember what you have achieved today is an outcome of not just your own efforts, but also the contributions of your parents, teachers and many more around you. Each one has played a role in your success. Always remember that no person is successful just by himself or herself.

Today, as you step into a new phase in your life, you are at the cusp of immense possibilities and opportunities. The nation is witnessing a new sense of dynamism and awakening.

Recent Developments

As you step into your new roles, it is an appropriate time to reflect on the recent developments in global and Indian economy, and what the future may hold for our country.

In recent years, the global economy has seen a period of unprecedented turbulence and uncertainty. Some of these are: the devastation caused by the Covid-19 pandemic to lives and economy, trade war between two largest economies, geopolitical tensions in Ukraine and in the Middle East, challenges of climate change, and impact of transformational technologies such as Artificial Intelligence (AI).

The challenges had far-reaching economic impact: cost-of-living crisis caused by persistent and broadening inflation pressures, especially of food and energy; looming slowdown in several large economies; shift in global supply chain; rising economic nationalism; and social polarisation. All these are eroding trust and cooperation among countries and within societies.

These challenges require bold and innovative actions that can foster inclusive and sustainable growth, while also addressing the root causes of inequality and instability.

A new world order is likely to emerge.

This is the context in which students, faculty members, researchers and institutions such as the IGIDR need to define their roles and responsibilities, not only for themselves but for the country. These challenges also provide immense opportunities to the country and to all of us.

We need to analyse what we have done so far, particularly during the last nine years, assess our strengths and weaknesses, capacities and constraints and prepare ourselves for the coming years.

Prime Minister's Vision of India 2047

Our Prime Minister has a grand vision for India 2047, that he has articulated on various occasions. India should achieve the status of a developed country, while caring for both nature and culture.

It will not only adopt and implement technology, it will be a thought leader in science and technology.

It will be *atmanirbhar* in all sectors.

Women will be leading India's development story.

The economy will be even more inclusive and innovative.

Corruption, casteism and communalism will have no place in our national life.

Approach to Economic Development

In this context I would like to highlight some salient aspects of our approach to economic development during the last nine years.

The approach of our Prime Minister to economic policy can, I would hypothesise, be described as Schumpeterian in nature. He believes that we need to continuously innovate and reinvent ourselves to remain competitive and grow in this fast-changing world. I will illustrate this approach with the help of four aspects:

- Promoting competitiveness of the economy
- Promoting use of technology
- Meeting global challenges and India's global role
- Effective delivery and reaching the last mile

Reform Measures

Starting from the incorporation stage of a company, Government introduced a single SPICE+ (Simplified Proforma for Incorporating Company Electronically Plus) form which combines 10 services such as labour, PAN card, and GST registration.

Efforts were made to resolve the NPA problem by measures such as recapitalization and governance reforms in public sector banks, along with schemes such as MUDRA and Stand-up India to ensure availability of credit to firms.

The Goods and Services Tax (GST) – to have a single indirect tax in place of many – that was discussed for decades, became a reality in 2017 because of Government's commitment and boldness. Reducing compliances has been a priority: more than 40,000 compliances across Central and State Governments have been rationalised. The Insolvency and Bankruptcy Code (IBC), a comprehensive resolution framework, helped early resolution of loans and continuity of firms.

In the context of the Covid-19 pandemic, when most countries were focused on huge stimulus packages, we chose the path of reforms. Examples are: articulating a clear policy for public sector enterprises (PSEs); opening several sectors such as defence, space and atomic energy to private sector; and further liberalisation of FDI. Labour reforms had been much talked about for decades. We took a balanced approach of overhauling the entire framework of labour laws along with providing safeguards for the rights of workers.

These second-generation reforms were possibly much more difficult requiring significant investment of political capital than just opening up of the economy. Also, this was by choice and not by compulsion.

In the context of the Covid-19 pandemic, RBI took very timely steps in announcing monetary measures which created confidence in the financial sector and even the real economy.

Sound macro-economic fundamentals such as relatively low inflation, strong balance of payment and high forex reserves were possible because of a rational approach.

A crucial part of enhancing the competitiveness of the economy and laying the foundation for accelerated growth has been the focus on infrastructure. The scale of infrastructure expansion in the last 4 or 5 years is well known.

Initiatives such as the PM Gatishakti and National Logistics Policy are critical elements for optimum use of resources and enhancing competitiveness. The use of GIS based tools and convergence of efforts of various infrastructure ministries have not only led to saving of time and cost, but also enabled seamless multi-modal connectivity thereby reducing both logistics cost and time.

In order to utilise the opportunities in the context of the geopolitical tension and make India a global manufacturing hub by helping our companies integrate into the global value chain, we lowered the direct tax rate, liberalised FDI norms, introduced PLI schemes to incentivise investment in sunrise sectors such as electric vehicles (EVs), solar energy, semiconductors and electronics. India concluded three Free Trade Agreements (FTAs) and several more are under negotiations.

Human Capital

Several initiatives have been taken to develop human capital for faster, inclusive and more equitable growth. The National Education Policy 2020, use of technology in education (e.g. Diksha platform and PM e-Vidya platform), the PM-Awas Yojana to construct 4.1 crore houses in rural and urban areas,

the Ayushman Bharat programme aiming to provide health coverage of up to Rs.5 lakhs per family to 6 crore families, the Jal Jeevan Mission aiming to provide functional household tap connections to every household (about 8.65 crore households already provided with tap water connection), the Ujjwala Yojana providing free gas connections to about 10 crore families and focus on skill development are measures for human resource development.

The Startup India initiative launched by the Prime Minister in January 2016 has evolved into the launchpad for ideas to innovation in the country. Several support measures to entrepreneurs have resulted in a robust startup ecosystem. It has the potential to transform India into a country of job creators rather than job seekers. Today there are more than 1.14 lakh startups that have reported creation of more than 12 lakh jobs with an average of 11 jobs by a startup.

PM-SVANIDHI scheme enabled loans to more than 58 lakh street vendors. It also promoted use of digital transactions and brought them into formal economic system and increasing their opportunities.

The PM Vishwakarma scheme has a comprehensive approach envisaging support to artisans and craftspeople, who work with their tools. The components of the scheme include financial help for improved tools, upgrading their skills and marketing of the products.

Use of Technology

An important area of focus has been on use of technology with a view to improving governance and also promoting innovation by economic players. Initiatives such as the JAM trinity (Jan Dhan, Aadhaar, and Mobile) and Unified Payments Interface (UPI) have fundamentally changed not only the delivery of benefits directly to the citizens but also in their financial inclusion and empowerment.

During the Covid-19 pandemic, the use of technology enabled real time monitoring of testing and vaccination of millions of individuals. It was possible to administer over 200 crore vaccine doses within a few months. The development of Co-Win platform was a landmark development.

Efforts are being made to extend the use of drones for agriculture, that can bring about transformative changes in farmers' efficiency and welfare.

Meeting Global Challenges

As per India's first Nationally Determined Contribution (NDC), it had a target of reducing emissions intensity of its GDP by 33 percent from the 2005 level and achieving about 40 percent cumulative electric power generation capacity from non-fossil fuel-based energy sources by 2030. These two targets have already been achieved.

There is a greater realisation that climate change is leading to more frequent disasters such as cyclones, floods, and excessive rainfall in areas which have not seen such phenomenon before. The economic impact in terms of loss and damage is increasing. India's initiatives such as the Coalition for Disaster Resilient Infrastructure (CDRI) and International Solar Alliance (ISA) are important landmarks in our efforts to address some of the challenges of climate change.

India's G20 Presidency has been globally acclaimed for its unprecedented scale, spread and success. Apart from its excellence in management, it has been instrumental in emphasising the importance of adopting new concepts towards nurturing a sustainable and better future for the world.

The New Delhi Leaders' Declaration underscores the importance of concepts such as Lifestyle for Environment (LiFE) and Going beyond GDP. This concept which was introduced by the Prime Minister of India during the CoP26 promotes environmentally conscious lifestyle that focuses on "mindful and deliberate utilisation," instead of "mindless and wasteful consumption."

The world leaders underscored the importance of committing to the implement the G20 High Level Principles of Lifestyles for Sustainable Development, thus presenting opportunities for conducting further research on issues regarding sustainability.

In the domain of digital public infrastructure, the declaration also welcomes the plan to build and maintain a Global DPI Repository (GDPIR), a virtual repository of DPIs and has also proposed One Future Alliance (OFA), a voluntary initiative aimed to build capacity and provide technical assistance and adequate funding support for implementing DPIs in low and middle-income countries.

The New Delhi Leaders Declaration also outlines the importance of leveraging Artificial Intelligence for public good.

Effective Delivery and Reaching the Last Mile

Traditionally, the Government of India focuses on policy measures, broad- based programmes and schemes. Implementation is largely left to the State governments and district administration. Prime Minister Modi puts great emphasis on effective delivery of benefits and services, and reaching the last mile. With the use of technology, he tries to ensure that schemes reach the intended beneficiaries and areas accurately and effectively. This aspect distinguishes his approach from his predecessors.

The Aspirational Districts programme and recently introduced Aspirational Blocks programmes are examples of reaching the last mile and giving special focus on areas that are disadvantaged.

Further, he aims at "saturation", which means covering all those who are eligible to get benefits of a scheme.

The approach today is an all-of-the-government and in many cases an all- of-the-nation approach. The idea is to involve and ensure participation of all the relevant agencies and people. This was evident in managing the Covid-19 pandemic and even organising the G20 events with more than 200 meetings at 60 locations across the country.

India's Future

The initiatives I have outlined indicate that India is at an inflection point. Among economies and among rating agencies there is a feeling that the Indian growth story is at a structurally higher path. However, on this journey we will face a number of challenges both domestic and international.

India has many strengths and opportunities that can help it overcome these challenges and achieve its vision. It is a vibrant democracy, a resilient economy, a young population, a large domestic market, rich civilizational heritage, and a strategic location. It has a visionary leadership, a spirit of entrepreneurship, innovation and aspiration that drives its progress.

The reforms and initiatives of Government of India in the last nine years have set the base for making India a developed nation by 2047. They have created conditions for faster and more inclusive growth, better governance and enhanced social welfare.

As Prime Minister Modi said in his speech at the UN General Assembly in 2019, "India's voice will always rise in support of peace, security and prosperity.

This will be an India that is in tune with its past but also looking towards the future; an India that will always strive for the well-being of the entire humanity." This is the India that we hope to see as a Developed Nation by 2047.

Role of Economics Research

As I mentioned earlier, research institutions and researchers can contribute a great deal to achieving the goal of Viksit Bharat, a developed India. Successful implementation of the vision of Viksit Bharat requires sound public policy that is transparent, accountable, and effective.

As Kurt Lewin, a German-American social psychologist, said: "No research without action, no action without research."

Economic research, particularly quantitative and empirical research provides insights into complex and dynamic realities of societies. They enable policy makers to assess the needs and preferences of their citizens, evaluate the impact and effectiveness of their interventions, and design policies that are responsive, inclusive and sustainable.

Economic research can help policy makers identify and understand the problems and opportunities that they face. As Albert Szent-Györgyi, a Nobel laureate in medicine, said: "Research is seeing what everybody else has seen and thinking what nobody else has thought."

By applying rigorous methods and analysis to data, economic researchers can uncover new patterns, trends, relationships, and causalities that can inform policy decisions. For example, economic research can reveal the drivers and consequences of poverty, inequality, migration and many other phenomena that affect the well-being of people and societies.

Second, economic research can help policy makers formulate and implement policies that are based on facts and logic rather than perception and intuition. Use of data to test hypotheses, evaluate alternatives, monitor progress, and measure outcomes, is very critical.

It can enable policy makers to ensure that their policies are aligned with their objectives and responsive to changing circumstances. For example, economic research can help policy makers design optimal tax

systems, social protection schemes and regulatory frameworks that can achieve desired goals, while minimising unintended consequences.

Third, economic research can help policy makers communicate and justify their policies to the public and other stakeholders. By providing clear and convincing evidence for their policies, policy makers can enhance their legitimacy, credibility, and accountability. They can also foster public trust, participation, and support for their policies.

In the context of Five-Year Plans, since 1950s economists tried to use theoretical frameworks and economic models. The first Five Year Plan, which was essentially a collection of several projects, contained a Harrod-Domar type of exercise. It sought to examine the growth rates that could be achieved based on marginal savings rate and the resultant average saving ratio.

The second Five Year Plan adopted the Feldman-Mahalanobis type of structural model. It emphasised the physical aspect of investment and analyses, subject to certain restrictive assumptions, transformation possibilities, domestically and through foreign trade. It was based on the presumption that raising of domestic of investment requires increased domestic manufacturing of capital goods.

The third Five Year Plan marked a shift away from the simple decision models. An attempt was made for inter-industry consistency in some detail. The models became more comprehensive during the fourth Five Year Plan. They involved finite time horizon linear optimisation model involving explicit inter- sectoral and inter-temporal relationship. There were policy debates relating to aspects such as physical planning in contrast with financial planning.

Thus, there was a steady evolution of economic thinking during the early decades after independence. Of course, the linkage between economic thinking and actual plans were often tenuous. Sometimes, designing of models were to provide post-facto justification of investment decisions taken on political grounds.

Another example of impact of economic thinking was a widely used term the 'Washington consensus' coined in 1989 by economist John Williamson, which became much more prominent in the 1990s. It recommended 10 policy reforms such as reducing budget deficits, reforming tax system, liberalisation of financial sector, competitive single exchange rate, reduction of trade restriction, abolition of barriers to foreign direct investment, privatisation of state-owned enterprises, etc.

Though economists were divided on its applicability to developing countries for two decades, it was widely recommended.

It was in this context that globalisation became a buzzword in international arena. In recent times, in the context of the geopolitical developments leading to disruption in trade, investment and value chains, and also political efforts at reshoring and friend-shoring, some analysts predict death of globalisation, some others feel that globalisation is alive and will continue to remain relevant.

The emergence of big data, new technologies like blockchain, new market models like decentralized finance and need for interdisciplinary research to address emerging challenges have made the task of economists very difficult. However, while reinventing ourselves with new ideas and new technologies, utilizing the latest AI and Big Data research tools, and fostering a synergistic ecosystem between universities and policy research sectors, we can effectively respond to the demands of our times.

Research institutions such as IGIDR may consider reaching out to universities with training programmes and modules in quantitative methods for building capacity of the upcoming PhDs. The University Connect programme launched by the Ministry of External Affairs in collaboration with a Delhi based think-tank can be one of the approaches. They conducted lectures in 101 universities nation-wide ahead of the G20 Summit introducing young students to the ideas of prominent thought leaders. The think-tank has also launched a new scholarship programme aimed at training PhD scholars in research methods and statistics.

As economists you have a vital role to play in advancing the frontiers of knowledge and informing the decisions that shape our society. Whether you pursue careers in academia, government, or the private sector, you can contribute to the common good by applying your skills and insights to the complex problems of our time. I urge you to use your talents and passions to make a positive difference in the world.

Congratulations and best wishes for your future endeavours.

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CAMPUS NEWS

Capacity Building Programme on National Education Policy—2020

The Capacity Building Programme on 'National Education Policy 2020 Orientation and Sensitization Programme' was organized by Malaviya Mission Teacher Training Centre (MMTTC), Central University of South Bihar, Gaya, recently through online mode. About 200 participants from various states registered themselves for the programme.

During the Inaugural Session, Keynote Speaker, Prof. Harikesh Singh, Former Vice Chancellor, Jaya Prakash University (JPU), Chapra highlighted the role of constitutional values, human values, and ethics in higher education and delineated the process of how to become *Raja Dashrath* by practicing *Sanatana* values rather than ignoring the values and become *Dashanana*. Further, he highlighted the significance of the National Research Foundation (NRF) for improving the quality of frontline research in the field of education. Prof. Kameshwar Nath Singh, Vice Chancellor, Central University of South Bihar (CUSB), Gaya highlighted the importance of skills in higher education i.e., academic, professional, vocational, and life skills that help the holistic development of students. Further, he appealed for making *Viksit Bharat* keeping in mind the significance of the 4D's i.e., Decolonization of Mindset, Digitalization, Decarbonization and Decentralization to Address the Issues and Challenges of 21st Century. Further, he expressed *Bhartiya Talent* in the form of the equation that Indian Talent + Information Technology = 'India Tomorrow'.

Prof. Sudhanshu Bhushan, National Institute of Educational Planning and Administration (NIEPA), Delhi gave an overview of multidisciplinary, pluridisciplinary, interdisciplinary, transdisciplinary, cross-disciplinary curriculum, the relationship between curricular structure and curricular growth and explained restructured curriculum and its effect on employability and needs of the market.

Prof. Kopella Narayan Praduvi Raju, Banaras Hindu University, Varanasi emphasized the Bhartiya Knowledge System overview and methods of ancient sources of knowledge that were in the great texts of *Vedas, Upanishads, Puranas*, etc. and great masters such as *Charaka, Kanad*, *Bhaskara,* etc.

Prof. Pawan Kumar Sharma, Chaudhary Charan Singh University (CCS) University, Meerut pondered upon *'Bhartiya Gyan Parampara'* and cited various references like *Agastya Samhita* and *Vaimanika Shastra*, how can it be incorporated into the curricula and content writing for achieving the target of NEP—2020.

Prof. Chandra Pal Singh Chauhan, Aligarh Muslim University (AMU), Aligarh stressed the expansion and transformation of the higher education system to ensure the social relevance of higher education in *Bharat* about NEP—2020. He said that transformative and radical changes in higher education systems like multiple disciplinary and integrated education institutions, ability enhancement courses, MERUs, and research-intensive universities will be helpful to develop the research ecosystem and quality education at every level across the nation.

Prof. Kumar Suresh, Head, Department of Educational Administration (DEA), National Institute of Educational Planning and Administration (NIEPA), New Delhi described different types of leadership, like academic leadership, executive leadership, transactional leadership and creative leadership. He also discussed the skills of academic leadership and its different models.

Prof. Chandra Bhushan Sharma, Former Chairperson, National Institute of Open Schooling (NIOS), Delhi discussed the effect of globalization and internationalization of higher education on the education system and economy of *Bharat*. He also gave examples of the ancient Indian world-class universities like Nalanda, and Taxila's international education practices for understanding the purpose of the internationalization of education which is empowering and enlightening the people of the world through education.

Prof. Brajesh Kumar, CUSB explained how higher education helps to build a good, enriched, and healthy society and provides a quality of life through research, innovation, and employability. Further, he said that there is a need to increase the funds for maintaining the standard of quality education and quality research in the field of education. Prof. Venkatesh Singh, Coordinator, Internal Quality

Assurance Cell, CUSB, Gaya expressed his views on research quality and networking with global bodies. He also highlighted a comparative analysis of the quality of research in *Bharat* with other countries.

Prof. Durg Vijai Singh, Director, Research and Development Cell, CUSB, Gaya spoke on research proposal development, management and quality publications. He talked about different research funding agencies, opportunities, basic considerations for preparing project proposals, procedures, and criteria for evaluating proposals. Prof. Atish Prashar, Former, CUSB Gaya stressed promoting vocational and entrepreneurial education at higher education across the country which helps to increase employability skills and even helps to make India '*Atamnirbhar Bharat'*. Prof. Nagendra Singh, Regional Institute of Education (RIE), Ajmer highlighted the significance of equity and inclusivity in higher education for promoting access and achieving excellence. Further, he discussed the different policy perspectives, Govt. as well as local level initiatives, and ancient practices to know how educational institutions can be connected with their surroundings and community.

Prof. Rajani Ranjan Singh, Dr. Shankuntala Misra National Rehabilitation University (DSMRU), Lucknow expressed his views on equitable and inclusive education in higher education and cited the different pedagogical practices for inclusion in higher education like UDL, IEP and pedagogical practices like pedagogy, andragogy and heutagogy along with diagnostic assessment.

Prof. Pradeep Kr Misra, NIEPA highlighted the significance of ICT in education in terms of access, inclusion, and quality education and emphasized that technology is a tool or technique to make the teaching-learning process conducive. Prof. Ravi Kant, CUSB Gaya discussed various teaching strategies like LMS, collaboration, inclusive practices, etc. to use in the era of today's digitally and technically sound world.

On the concluding day, Prof. Prakash Chandra Agrawal, Principal, RIE Bhubaneswar suggested reducing the course to the school level and encouraged the students to involve experiential learning, visit the local arts, Rashtriya Avishkar, visit the labs, ITI Polytechnic and higher-level education institutions to promote higher order-thinking skills. Further, he also suggested collaborative efforts to develop the career interest and holistic development of students by visiting educational institutions, industries, and Rojgar mela, integrating the local artisans and industries with school and higher education, community involvement, and linkage between academia and industries, provision of professor of practices, NMMS, NVEQF, innovation hubs, and incubation centers in the education institutions, etc. for radical change in the education system.

Prof. Kameshwar Nath Singh, Vice Chancellor, Central University of South Bihar said that the university is dedicated to *Viksit Bharat @2047* is the Motto of CUSB for the year 2024. He said that there is a need to focus on '*Panchkoshiya Shiksha'* for the holistic development of learners and focus on 'Nationalization, Indianization and Spiritualisation' and 'GYAN' (*Garib, Yuva, Annadata* and *Nari Shakti*) that leads to achieving the goal of *Viksit Bharat 2047*. The inaugural and valedictory sessions of the event started with '*Saraswati Vandana'* and 'University *Kulgeet*' and ended with the National Anthem. The programme was Coordinated by Dr. Tarun Kumar Tyagi, Director, Malaviya Mission Teacher Training Centre, Central University of South Bihar, Gaya and moderated by Lt (Dr.) Pragya Gupta, Assistant Professor, Department of Education, CUSB, Gaya.

Based on the discourse by eminent resource persons and feedback received by participants, it is concluded that Bharat-centric education, the judicious blend of '*Bhartiya Gyan Parampara'* and 'Modern Education System' will be helpful to ensure equitable and inclusive education for all, cater the need of 21st century learners and fulfill the need and aspirations of the dynamic society.

Book Release Ceremony

A Book Release Ceremony was organised at Indira Gandhi National Centre for the Arts (IGNCA), New Delhi to release the Book '*Mapping Doctoral Research in Library and Information Science in India 1950-2023*' (Two Volumes) authored by Prof. Shashi Prabha Singh, Former Head and Emeritus Department of Library and Information Science, University of Delhi, Delhi and Dr. Parveen Babbar, Deputy Librarian, Jawaharlal Nehru University, Delhi.. Dr. Sachidanand Joshi, Member Secretary, Indira Gandhi National Centre for the Arts, Delhi was the Chief Guest of the ceremony. Dr. Jagdish Arora, Former Director, INFLIBNET and Advisor, National Board of Accreditation (NBA), New Delhi was the Guest of Honour along with the Chairperson,

Prof. (Dr.) Ramesh C Gaur, Dean Academic and Head, Kalanidhi, IGNCA. Other dignitaries on the dais included Prof. R K Bhatt, Head, Department of Library and Information Science, University of Delhi; Prof. K P Singh, Director, Gandhi Bhawan, a constituent unit of the University of Delhi; Dr. Usha Munshi, Librarian, India International Centre, New Delhi. Dr Sachidanand Joshi in his inaugural address, appreciated the importance of the book in a digital environment. He mentioned the work under launch as 'A Monumental Work' having archival importance. He also discussed the importance of libraries and librarians in any type of institution.

Prof. Jagdish Arora said that the book can provide the base for further research on various aspects. Prof. R C Gaur delivered the concluding remarks and invited all the professionals for the new ventures to explore and contribute to the growth of the profession by coming together. Dr. Pinki Sharma moderated the event and proposed the vote of thanks..

Workshop on Artificial Intelligence Models

The one-week Workshop on 'Artificial Intelligence Models for Remote Sensing and its Applications' is being organized by the Department of Computer Science and Engineering, National Institute of Technology Puducherry, Karaikal, Puducherry from June 06-12, 2024. The Ph.D. scholars, postgraduate and final year undergraduate students may participate in the event.

Artificial Intelligence (AI) has significantly improved remote sensing by automating and optimizing tasks, enhancing data interpretation accuracy and efficiency. This technology has been applied in various fields, including image classification, object identification, and change detection. AI has been effective in land cover classification and object identification, benefiting various fields like environmental surveillance, urban development, farming, crop mapping, and emergency response. AI for remote sensing includes integrating data from multiple sensors, managing large datasets, and integrating quantum computing. The Course Outlines are:

- Introduction to Remote Sensing (RS).
- Overview of Artificial Intelligence.
- Machine Learning Models for RS.
- Deep Learning Models for RS.
- Classification and Object Detection.
- Change Detection and Monitoring.
- Multi-sensor Data Fusion.
- LULC Using AI.
- Generative AI for RS, Explainable AI for RS.
- Quantum AI in RS.
- Hyperspectral and LiDAR Data Analysis.
- Operational Remote Sensing with AI.

For further details, contact Convener and Coordinator, Dr. M Venkatesan, National Institute of Technology Puducherry, Karaikal, Puducherry-609609, Mobile No: 09442314011, E-mail: *venkisakthi77@gmail.com/venkatesan.msundaram@nitpy.ac.in.* For updates, log on to: *www.nitpy.ac.in*

Short-term Training Programme on Air Pollution

A five-day Short-term Training Programme on 'Air Pollution: Monitoring, Modelling, and Decision Making' is being jointly organized by the Civil Engineering and Chemical Engineering Departments, Maulana Azad National Institute of Technology, Bhopal, Madhya Pradesh from June 05-09, 2024.

Air pollution is one of the most difficult challenges faced by our country today. India's commitment to clean and pollution-free air is well reflected in the National Clean Air Programme (NCAP), launched in 2019 by the Ministry of Environment, Forest and Climate Change (MoEF &CC). The focus is a collaborative and participatory approach involving different stakeholders (from the ministry to the common people) to reduce air pollution in the country. Atmospheric aerosol measurement and Source Appointment (SA) studies are important for understanding the sources of particulate matter, pollution outflow, and large-scale regional impacts. Thus, SA studies are necessary to formulate and implement mitigation and management plans for air quality improvement. The Major Areas of the Event are:

- Gaseous and Particulate Air Pollutants.
- Knowledge of Air Speciation Samplers.
- Air Pollutants-based Measurement Techniques (Organic Carbon Analyzers Thermal/Optical

Reflectance, Transmission, and Thermal Manganese Oxidation, Energy Dispersive X-ray Fluorescence.

- Meteorology and Dispersion Modeling.
- Receptor Modeling.
- Mobile Sources.
- Indoor Air.
- Effects on Plants, Materials, Humans, and Animals.
- ArcGIS, AERMOD and CMB8.0 Software.
- Carrying Capacity and Multi-source Simulation Model.
- Environment Planning and Management.

For further details, contact Coordinator of the Event, Department of Chemical Engineering, Maulana Azad National Institute of Technology, Bhopal-462003, Madhya Pradesh, Mobile No: 09244184604 and 09754813538, E-mail: *sureshs@manit.ac.in*. For updates, log on to: *www.manit.ac.in*

AIU News

Faculty Development Programme on Data-driven Research

The One-week Faculty Development Programme on 'Data-driven Research with Advanced Data Analysis Tools' was organized by the Association of Indian Universities (AIU)─Academic and Administrative Development Centre, Atal Bihari Vajpayee University, Bilaspur from September 20-26, 2023. About 64 participants were registered for the event.

Dr. H S Hota, Head, Department of Computer Science and Application, Atal Bihari Vajpayee University, Bilaspur highlighted the focus of the event on equipping participants with advanced data analysis tools and techniques, emphasizing the critical role of data-driven research in today's rapidly evolving academic and professional landscape. Dr. Hota's comprehensive overview ignited a sense of curiosity and enthusiasm among the participants, setting the stage for an intellectually stimulating week ahead.

Dr. Rashmi Gupta, Coordinator proposed the Vote of Thanks for the inaugural session. She deeply appreciated Dr. Hota for his invaluable insights and contributions to the programme. Dr. Rashmi also extended her gratitude to the participants, and faculty members. The session concluded on a note of gratitude and anticipation, setting a positive tone for the week ahead.

The Session on 'Introduction of SPSS Software' was handled by Dr. Pushkar Dubey, Pt. Sunderlal Sharma Open University, Bilaspur, Chhattisgarh. In the session, Dr. Dubey introduced participants to the world of Statistical Package for the Social Sciences (SPSS) software, a vital tool in research and data analysis. The session commenced with an overview of the software's significance and a guided tour of the SPSS user interface. Dr. Dubey provided hands-on experience in data entry, and manipulation, and emphasized the critical role of data preparation. He encouraged participants to explore SPSS's advanced features for in-depth statistical analysis and visualization. The interactive question and answer session allowed participants to clarify doubts and left them eagerly anticipating upcoming sessions where they will delve deeper into SPSS's applications.

Dr. Sujit Kumar Mishra, Guru Ghasidas University, Bilaspur, Chhattisgarh handled the session on 'Statistical Methods on Quantitative Data using SPSS'. Dr. Mishra adeptly covered the fundamentals of statistical analysis, types of quantitative data, and the practical application of SPSS software. Participants gained valuable insights into data preparation, descriptive and inferential statistics, and engaged in hands-on exercises. The session not only met its objectives but also left attendees better equipped to apply statistical methods in both research and teaching.

Dr. Sharda Bharti, National Institute of Technology, Raipur, Chhattisgarh handled the session on 'Introduction of Design Experts'. He introduced participants to the powerful world of Design Expert software. The session was dedicated to unveiling the potential of Design Experts in experimental design and data analysis, shedding light on its immense significance in both research and

industry applications. Dr. Bharti, with her profound knowledge, began by emphasizing the pivotal role of experimental design in research and production processes. She guided the participants through the software's user interface, unraveling its menus, toolbars, and essential features. Real-life examples and case studies illuminated the practical utility of the software, providing participants with a deeper understanding of its capabilities. The interactive question and answer session that followed further enriched participants' comprehension, leaving them eager to explore and apply Design Expert in their future research and practical projects. Dr. Bharti's expertise and engaging teaching style were deeply appreciated by the participants, who now look forward to embarking on their journey of harnessing the potential of Design Expert for their academic and industrial pursuits.

Dr. Seema Belorkar, Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur, Chhattisgarh spoke during the session on 'Introduction of Experiment Design in Design Expert Tool'. The session was a profound exploration of experiment design using the Design Expert tool. Dr. Belorkar commenced the session by highlighting the pivotal role of experimental design in research and development, elucidating its core principles. The Design Expert software, a powerful tool in this context, was introduced, with participants gaining insight into its user interface and functionalities. Through practical demonstrations and real-life case studies, Dr. Belorkar illustrated how to design experiments, set factors and responses, and optimize processes using Design Expert. Hands-on practice allowed participants to apply their newly acquired skills. The session left participants eager to incorporate experiment design principles and Design Expert into their research and industrial projects, as they expressed their gratitude to Dr. Seema Belorkar for her expertise and engaging teaching style.

Prof. Naval Bajpai, Indian Institute of Information Technology and Management, Gwalior (MP) was the speaker during the session on 'Data Analysis Using Statistical Tool'. Prof. Bajpai commenced the session by providing an overarching view of the importance of data analysis and its role in shaping informed decisions across various domains. Throughout the session, he meticulously covered a wide array of statistical tools, including R, Python, and Excel, outlining their respective strengths and practical applications. Practicality was at the core of the session, as Prof. Bajpai elucidated the significance of Exploratory Data Analysis (EDA) and elucidated the intricate process of hypothesis testing. The participants were actively engaged through real-world case studies and practical examples, fostering a dynamic learning environment. Prof. Bajpai's session not only enriched the participants' knowledge but also exemplified the essence of continuous learning and skill development that the FDP strives to promote among educators.

Dr. Rachna Vishwakarma, Central University of South Vihar, Gaya (Bihar) spoke on the 'Introduction of AMOS**'.** The session commenced with an illuminating overview of SEM's significance in diverse academic domains, setting the stage for AMOS's introduction. Dr. Vishwakarma guided participants through the AMOS software, elucidating its user-friendly interface and capabilities for intricate statistical analyses. Practical application was at the forefront, as attendees learned to specify and estimate SEM models, evaluate their fit, and interpret results. The session's hands-on exercises allowed participants to put theory into practice, fostering a deeper understanding of AMOS's functionalities. Dr. Rachna Vishwakarma's expert guidance not only empowered participants with a valuable skill set but also exemplified the FDP's commitment to nurturing continuous learning and skill development among educators and researchers.

Mr. Nilesh Verma, Waikaito University, New Zealand spoke on 'Programming in Python (Basic)'. Mr. Verma adeptly guided the attendees through control structures, elucidating the intricacies of statements, loops, and conditional statements. Furthermore, he shed light on functions and modules, showcasing their utility in building modular and efficient code. The session's hands-on coding exercises provided a practical dimension to the learning process, enabling participants to translate their newfound knowledge into tangible programming skills. The session was instrumental in fostering Python proficiency among educators and researchers, aligning with the FDP's mission of promoting continuous learning and skill development within the academic community.

Dr. Vijay Bhaskar Semwal, MANIT, Bhopal (M.P.) was the speaker of the session on 'Statistical Analysis and Machine Learning with Python'. The

session focused on the application of statistical techniques in data analysis and the integration of machine learning algorithms using Python programming. Dr. Semwal provided an in-depth understanding of key statistical concepts and demonstrated practical implementations through hands-on examples. The lecture served as a valuable resource for educators aiming to incorporate data-driven approaches into their teaching and research. Participants gained practical insights into leveraging Python for statistical analysis and machine learning, enhancing their skills and knowledge in these crucial areas. The engaging session contributed significantly to the FDP's objective of empowering faculty members with contemporary tools and techniques in the field of data science.

Dr. Suraj Sharma, Guru Ghasidas University, Bilaspur, Chhattisgarh delivered on the theme 'Programming in R (Basic)'. Commencing with the introduction to R's significance in data science and research, Dr. Sharma guided participants through the core elements of R, including data structures, variables, control structures, and functions. Hands-on exercises provided participants with practical experience, solidifying their understanding of R programming. Feedback from participants resonated with Dr. Sharma's structured teaching approach and the session's practical focus. In essence, the event was a testament to the FDP's dedication to continuous learning and skill development, equipping educators and researchers with the prowess to leverage R effectively in their academic and research pursuits.

Dr. Vivek Tiwari, IIITM, Gwalior (MP) spoke on 'Statistical Analysis with R'.Commencing with a comprehensive introduction to statistical analysis, Dr. Tiwari seamlessly transitioned into the practical aspects of using R for data manipulation and exploratory data analysis. The session encompassed a wide array of statistical tests, including t-tests, ANOVA, and regression analysis, providing participants with a holistic view of R's analytical capabilities. The inclusion of packages for data visualization further enriched the session, enabling participants to create visually compelling representations of their analyses. The hands-on practical exercises facilitated an immediate application of the learned concepts, solidifying participants' grasp of statistical analysis with R. Feedback from participants highlighted Dr. Tiwari's effective teaching style and the practical relevance of the session content, underscoring the success of the event in promoting proficiency in statistical analysis using R within the academic community.

Dr. Babita Manjhi, Guru Ghasidas University, Bilaspur, Chhattisgarh spoke on 'MATLAB'. The hands-on experience provided insights into variable declaration, matrix manipulation, and the creation of custom functions and scripts. Dr. Manjhi also emphasized the practical aspects of MATLAB, including data import, numerical computation, simulations, and data visualization. Real-world applications highlighted the software's versatility in solving complex problems and streamlining data analysis workflows. Feedback from participants underscored Dr. Manjhi's effective teaching style, with participants noting the practical relevance of the session content. In essence, the event empowered educators and researchers with the essential skills to leverage MATLAB effectively, aligning with the FDP's mission to foster continuous learning and skill development within the academic community.

During Valedictory Function, many participants shared their feedback about the faculty development Programme. Dr. H S Hota, Head, Department of Computer Science and Application, Atal Bihari Vajpayee University, Bilaspur addressed the participants and wished them a bright future. Coordinator, Dr. Rashmi Gupta proposed the Vote of Thanks. The certificates were provided to 58 participants.

Faculty Development Programme on Mentoring Pedagogy and Classroom Delivery Enhancement Techniques

A six-day Faculty Development Programme on 'Mentoring Pedagogy and Classroom Delivery Enhancement Techniques' was organized by the Association of Indian Universities (AIU)─Academic and Administrative Development Centre, The University of Science and Technology Meghalaya (USTM) from January 08-13, 2024 through blended mode.

Prof Raghavendra P Tiwari, Vice Chancellor, Central University of Punjab, Bathinda was the Chief Guest of the event. Prof G D Sharma, President, AIU and Vice Chancellor, USTM, Convener, Dr Amarendra Pani, Joint Director and Director (I/c), Research Division, AIU and Coordinator, Dr Usha

Rai Negi, Assistant Director, Research Division, AIU graced the event with their presence. The Resource Person for the session was Mr. Anjan Chaudhuri impaneled Trainer, Dibrugarh University, Assam Administrative Staff College, EICT Academy, and IIT Guwahati. The event aimed to enhance classroom management and emotional intelligence skills among educators, emphasizing life skills essential for both teachers and students. The programme explored different topics like life skills, which are essential for both educators and students. The focus was not only on academic knowledge but also on developing emotional intelligence, empathy, and interpersonal skills among teachers. Understanding the importance of communication in creating a conducive learning environment was a key objective.

The programme delved into the significance of both verbal and non-verbal communication. Verbal communication skills were honed to ensure clarity, coherence, and effectiveness in conveying ideas. Participants were encouraged to refine their language, tone, and articulation to resonate with diverse learners in the classroom. Non-verbal communication was explored through the lenses of kinesics, proxemics, and chronemics. Kinesics, which involves body language and facial expressions was dissected to help teachers convey emotions, enthusiasm, and engagement effectively. Proxemics, the study of personal space, was discussed to help educators understand the impact of physical distance on communication and build a positive rapport with students. Additionally, chronemics, the study of time in communication, was highlighted to emphasize the importance of pacing and timing in delivering instructions and managing classroom activities.

Throughout the programme, practical exercises, role-playing scenarios, and case studies were utilized to provide hands-on experience and facilitate a deeper understanding of the concepts discussed. The goal was not just to equip teachers with theoretical knowledge but to empower them with practical skills that could be seamlessly integrated into their teaching methodologies. By the end of the week, participants were expected to have a comprehensive toolkit encompassing life skills, effective verbal and non-verbal communication strategies, and a nuanced understanding of kinesics, proxemics, and chronemics.

The event concluded with the Valedictory Function, graced by the presence of Prof. Ramesh Ch. Deka, Vice Chancellor, Cotton University, Guwahati, Assam as the Chief Guest. Other distinguished dignitaries included Prof. G D Sharma, Vice Chancellor, USTM, Meghalaya, Dr. Pankaj Mittal, Secretary General, AIU, and Dr. Amarendra Pani, Joint Director and Head, Research Division and other dignitaries. The programme culminated with an uplifting message, emphasizing that the knowledge acquired should ignite our passion for education, and our collaborative efforts should pave the way for a brighter and more enlightened future.

❑

AIU Notification for Inviting Proposal for AADC

Association of Indian Universities, apex level representative body of universities and other higher education institutions in India, invites proposals with Expression of Interest (EOI) from the member universities for its newly introduced scheme-**Academic and Administrative Development Centres (AADC)** to be established in select member universities.

AADC is pioneering initiative of AIU that aims at organizing short-term training and capacity-building programmes for the faculty members and administrative functionaries of Indian Universities and other HEIs. Introduced in the year **2022**, AADC is envisioned to function in a similar manner to the UGC Human Resource Development Centers operating in different universities. The focus of these centers is to provide training to faculty for online/blended mode of teaching-learning, developing e-content, and using technology for continuous assessment and evaluation and research collaboration along with programs on effective management using technology in governance and administration of universities.

Interested Member universities/institutions may send their **Expression of Interest** (EoI) along with a proposal duly endorsed by the Head of the Institutions to AIU at the address given below:

Dr Amarendra Pani
Joint Director & Head (Res)
Association of Indian Universities
AIU House, 16 Comd. Indrajit Gupta Marg
New Delhi – 110 002
E-mail*: researchaiu@gmail.com*

The proposals are required to be submitted latest by May 15, 2024. For any further query please contact on: 011-23230059, Extn-202, **E-mail:** ***researchaiu@gmail.com***. The details can also be downloaded from AIU Website: ***www.aiu.ac.in***

The general terms and conditions of establishing AADC are as follows:

- AADC is to be established under the banner of AIU and be named as **AIU-……. University Academic and Administrative Development Centre**.
- AIU-AADC will offer short-term programmes of varying duration aimed at continuous capacity building of the key stakeholders through online and in-person modes.
- The Centres are to be allocated to **15** selected member universities of AIU based on their interest and required infrastructure.
    - Initially, seed money of **Rs. 2.00 lakhs** will be provided by AIU as one-time financial support to each centre. Thereafter, the centers will be functioning in self-financing and self-sustaining mode
    - **Rs. 1.00 Lakh** will be provided at the beginning of the first programme and the remaining One Lakh will be released after receiving the utilisation certificate from the University.
    - Each Centre will organise **05** programmes in an Academic Calendar year.
- AIU will also provide academic support in identifying resource persons, planning and designing the academic aspects of the courses. The details of the programme structure, duration, selection of themes, preparation of training materials and modules, and resource persons will be decided on mutual consultation and cooperation with the host/concerned university.
- A report after each programme may be submitted to AIU for documentation and publishing in University News and uploading to the AIU Website.

AIU Invites Proposals for Collaboration for Organizing

ANVESHAN- International Student Research Conventions—2024-25

Association of Indian Universities organizes the ***Anveshan*-Student Research Convention** every year to identify and nurture the young talents and budding researchers in Indian Universities. In these Conventions, Innovative Research Projects are invited from the students (Undergraduate to Ph. D level), and assessed by a group of experts of the field on a well-laid criteria. The best Research Projects are conferred with certificates and awards. The Projects are invited in the disciplines of ***1) Basic Sciences & Applied Sciences, 2) Engineering and Technology, 3) Agriculture and allied fields, 4) Health Sciences and allied fields, 5) Social Sciences; Humanities; Commerce; Business Management; and Law, and 6) Interdisciplinary.*** The Conventions are to be held at two levels i.e. **Zonal and International**. The duration of each convention is of two **days**. These events are to be conducted in the current Financial Year i.e. before **March 31, 2025**.

AIU invites proposals from member universities/institutions for hosting these Conventions in Four Zones - East, West, North South, and One International Level Convention. Interested Member universities/institutions may send their **Expression of Interest** (EoI) along with a proposal duly endorsed by the Head of the Institutions to AIU at the address given below:

Dr Amarendra Pani
Joint Director & Head (Res)
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AIU House, 16 Comd. Indrajit Gupta Marg
New Delhi – 110 002
E-mail: ***researchaiu@gmail.com***

The proposals are required to be submitted latest by May 15, 2024. The Event will be finalized on mutually convenient dates and terms and conditions laid down by AIU. For any further query please contact on 011-23230059, Extn-202, **E-mail:** ***researchaiu@gmail.com***. The details can also be downloaded from AIU Website: ***www.aiu.ac.in.***

N.B.: AIU is not a Funding Organization. All these events are AIU activities for which Collaboration from member Universities/Institutions is solicited. Primarily, the events will be conducted under the banner of AIU. The details of terms and conditions will be communicated on the selection of the Proposal

The proposal must be sent to AIU with the Approval /Endorsement of the Vice Chancellor/ Head of the Institution.

THESES OF THE MONTH

HUMANITIES

A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of Feb-March, 2024)

Geography

1. Arya, Yashpal. **Sonipat Jile ke paristhitik ghatkoan ke swasthey par audhyogik gatividhioan ka vinashatamak prabhav**. (Dr. L C Verma), Department of Geography, Bhagwant University, Ajmer.
2. Saha, Somnath. **An appraisal of water quality in the Surat-Bharuch industrial Region, South Gujarat**. (Prof. Rolee Kanchan), Department of Geography, M S University of Baroda, Vadodara.

History

1. Ahirwar, Haricharan. **Satta sanrachna mein dalit varg: Naitritav evam bhagidari (Swatantraottar Bharat ke vishesh sandarbh mein)**. (Prof. Ashok Ahirwar), Department of History, Dr Harisingh Gour Vishwavidyalaya, Sagar.
2. Bhanderi, Shailesh Savjibhai. **A historical study of Kalavad Municipality (A D 1947 to 2014)**. (Dr. Manjulaben Tarapada), Department of History, Saurashtra University, Rajkot.
3. Bhatele, Divakar. **Myths, rituals and folklore: A social and cultural history of Central Himalaya: Kumaon and Garhwal 16th-18th century**. (Dr. Prashant Puranik), Department of History, Vikram University, Ujjain.
4. Gadhavi, Pratik Anilbhai. **The contribution of Rashtriya Swayamsevak Sangh at the time of natural disaster in Saurashtra: A historical study 1950-2020**. (Prof. Vishal R Joshi), Department of History, Bhakta Kavi Narsinh Mehta University, Junagadh.
5. Khadkiwala, Dhruv. **Pattern of State formation in Baroda: 1720-1939**. (Prof. Adhya Bharti Saxena), Department of History, M S University of Baroda, Vadodara.
6. Khan, Shahiad. **Saltanatkaleen aarthik sansthaoan ka tatkaleen janjeevan par prabhav**. (Dr. Dinesh Mandot), Department of History, Bhagwant University, Ajmer.
7. Parmar, Lalit Amrutlal. **A comparative study of the economy and its impact on the Princely States of Saurashtra: With special reference to Junagadh and Porbandar States from 1801 A D to 1947 A D**. (Prof. Vishal R Joshi), Department of History, Bhakta Kavi Narsinh Mehta University, Junagadh.
8. Prajapati, Vipulkumar Jagjivanbhai. **Mehsana District: A historical study (A D 1901-1999)**. (Dr. Kanaiyalal Nayak), Department of History and Culture, Gujarat Vidyapith, Ahmedabad.
9. Ramveer Singh. **Uttar Pradesh mein dalit aandolan: Ek eitihasik vivechan: Swatantrata prapti ke pashchat se vartman tak**. (Dr. S L Ware), Department of History, Vikram University, Ujjain.

LANGUAGES & LITERATURE

English

1. Al-Aidaros, Hussein Ali Hasan. **Translators culture and translating non-equivalents: A study of select Arab short stories**. (Dr. Rachel Bari), Department of English, Kuvempu University, Shankaraghatta.
2. Chauhan, Renukabahen Pratipsinh. **Trends in dalit writings and forming an identity in conflicting species**. (Dr. A K Patel), Department of English, Gujarat University, Ahmedabad.
3. Chhuchhar, Ajay Bhimabhai. **World literature and formation of popular fiction in Gujarati: A critical study of Jules Verne, Edgar Rice Burroughs and Alistair Maclean in translation**. (Dr. Sachin Ketkar), Department of English, M S University of Baroda, Vadodara.
4. Eiqana, Syed. **Colonisation and Indian fiction: A postmodern study on fictions of Anita Desai, Kiran Desai and Arundhati Roy**. (Dr. Chaitanya), Department of English, Bhagwant University, Ajmer.
5. Goswami, Hema Dinesh. **American dream and disintegration of love in the select works of F Scott Fitzgerald**. (Dr. Om P Joshi), Department of English, Bhakta Kavi Narsinh Mehta University, Junagadh.
6. Huda, Noorul. **History, women and conflict: A study of select women writings from Iran, Afghanistan and Pakistan**. (Dr. Rajendra Chenni), Department of English, Kuvempu University, Shankaraghatta.
7. Hussain, Ashraful. **Shakespeare's adaptation in Bollywood and Vishal Bhardwaj's trilogy: A socio-political study**. (Dr. Nabamita Das), Department of

English, Assam Don Bosco University, Guwahati, Assam.

8. Joshi, Shruti Hareshkumar. **Usage, acceptance and effectiveness of technology based teaching and learning English language during Covid-19 periods: A study**. (Dr. Rajesh R Ladva), Department of English, Bhakta Kavi Narsinh Mehta University, Junagadh.
9. Joshi, Yogita. **A study of post modern realities and feminist perspectives in the fiction of Anita Desai**. (Dr. Suresh Kumar), Department of English, Bhagwant University, Ajmer.
10. Kriplani, Babita Narotamdas. **Journey outwards and journey within to explore the hidden treasure: Taking place simultaneously in the selected works of Paulo Coelho**. (Dr. Indravadan G Purohit), Department of English, Bhakta Kavi Narsinh Mehta University, Junagadh.
11. Lalmalsawmi, V. **The politics of identity in select works by James Dokhuma**. (Prof. Margaret L Pachuau), Department of English & Culture Studies, Mizoram University, Aizawl.
12. Mitra, Arpita. **Aspects of African diaspora in August Wilson's Twentieth Century cycle of plays**. (Dr. Amrendra Narayan Singh), Department of English, T M Bhagalpur University, Bhagalpur.
13. Naresh, Kummara. **Select poems of KV Raghupathi: A thematic study**. (Dr. G Hampamma and Dr. V B Chithra), Department of English, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.
14. Rathore, Sanghmitra. **The English and Rajasthani folk literature: A study of human emotions**. (Dr. Deepak Kumar), Department of English, Bhagwant University, Ajmer.
15. Sharma, Priyanka. **Cuisine, culture and identity in the selected short stories of Anita Desai, C S Lakshmi, Chitra Banerjee Divakaruni and Jhumpa Lahiri**. (Dr. Rani Rathore), Department of English, IIS University, Jaipur.
16. Sharma, Smita. **Representation of the self and the other in selected works of George Orwell**. (Dr. Shivangi Bhatt), Department of English Literature and Language, IIS University, Jaipur.
17. Vatsa, Sangeeta. **A study of the works of Anita Nair: A feminist critique**. (Dr. B K Anjana), Department of English, Vikram University, Ujjain.

Gujarati

1. Gor, Chetanaben Pravinchandra. **Contribution of 'Natak' magazine in Gujarati literature**. (Dr. Hirji P Sinch), Department of Gujarati, Bhakta Kavi Narsinh Mehta University, Junagadh.
2. Solanki, Bhikhabhai Govabhai. **Narsinh Mehta Award awarded poets: A study: From 1999 to 2008**. (Dr. Rameshchandra A Sagathia), Department of Gujarati, Bhakta Kavi Narsinh Mehta University, Junagadh.

Hindi

1. Baraiya, Milanbhai Parshotambhai. **Nature portrayal in the poems of Dr Ramesh Pokhariyal Nishank: With reference to environment consciousness**. (Dr. Jitenkumar J Parmar), Department of Hindi, Bhakta Kavi Narsinh Mehta University, Junagadh.
2. Goraniya, Santok Dudabhai. **Alka Saraogi evam Maitreyi Pushpa ke upanyasoan mein istri chetna ka tulnatamak adhyayan**. (Dr. Pravinsinh R Chauhan), Department of Hindi, Saurashtra University, Rajkot.
3. Jethava, Jigneshkumar Natvarlal. **Various problems described in the dramatic literature of Habib Tanveer**. (Dr. Jitenkumar J Parmar), Department of Hindi, Bhakta Kavi Narsinh Mehta University, Junagadh.
4. Mehta, Yashodhara Shaileshbhai. **Gorakhnath evam Kabir ke kavye se nihsrit vichardhara**. (Dr. Jagrutiben N Pandya), Department of Hindi, Saurashtra University, Rajkot.
5. Ratawa, Rajshree. **Dr. Rajendra Mohan Bhatnagar ke upanyasoan mein mulye-bodh**. (Dr. Rajesh Kumar Sharma and Dr. Shivani Sharma), Department of Hindi, Bhagwant University, Ajmer.
6. Singh, Ram Raksha. **Asghar Vajahat ke upanyasoan mein samajik yatharth**. (Dr. Geeta Nayak), Department of Hindi, Vikram University, Ujjain.
7. Suman Kumari. **Rashtriya kavita ka bhashagat adhyayan: Makhanlal Chaturvedi tatha Ramdhari Singh Dinkar ke vishesh sandarbh mein**. (Dr. Anita Shukla), Department of Hindi, M S University of Baroda, Vadodara.
8. Vasava, Dharmendrakumar Nanubhai. **Tribal consciousness in selected Hindi novels**. (Dr. Jashvantbhai Pandya), Department of Hindi, Gujarat Vidyapith, Ahmedabad.
9. Yadav, Rakesh Kumar. **Hindi patrakarita ke kshetra mein Hans aur Rajendra Yadav: Ek anusheelan**. (Dr. Mayaprakash Shivprasad Pandey), Department of Hindi, M S University of Baroda, Vadodara.

Oriya

1. Chalan, Biraj. **Odishara aadima janajatinka dharmika parampara: Eka anushilana**. (Dr. Lusi Priyadarshani Nayak), Department of Odia, Kalinga Institute of Industrial Technology, Bhubaneswar.

Sanskrit

1. Dubey, Induja. **Geet Ramayanam ka sahitiyak anusheelan: Lokdharmi geeti parampara ke vishesh sandarbh mein**. (Dr. K K Thapak), Department of Sanskrit, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot, District Satna.
2. Kukreti, Viney. **Vastushastredrishtya bahutaliyavasiyebhavnanam sarvekshnam vivechnne**. (Dr. Desh Bandhu), Department of Sanskrit, Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

Sindhi

1. Dadlani, Chander Prakash. **Dr. Baldev Matlani: Safarnama nigar**. (Dr. Meena Aswani), Department of Sindhi, Bhagwant University, Ajmer.

PERFORMING ARTS

Dance

1. Arun, S. **Aesthetics of relationship between Vacika and Angika Abhinaya: With special reference to Bharatanatya**. (Dr. Shobha Shashikumar), Department of Performing Arts & Cultural Studies, Jain University, Bangalore.
2. Dave, Vrushika Jigar. **The therapeutic value of pilates in Indian classical dance-Bharatanatyam**. (Dr. Ami Pandya), Faculty of Performing Arts, M S University of Baroda, Vadodara.

Fine Arts

1. Paliwal, Anju. **A journey of traditional pottery to studio pottery and development of ceramic techniques of sculptures in India (1950-2010)**. (Dr. Giriraj Sharma), Department of Fine Arts, IIS University, Jaipur.

Philosophy

1. Bharti, Annu. **Nyaye bhasha-darshan: Ek samikshnatamak anusheelan**. (Dr. Nagendra Tiwari), Department of Philosophy, T M Bhagalpur University, Bhagalpur.
2. Kachhadiya, Bhavesh Babulal. **Advaita Vedanta in the bhajans of Bhakta Kavinarsinh Mehta**. (Dr. Parasotam V Barasiya), Department of Philosophy, Bhakta Kavi Narsinh Mehta University, Junagadh.
3. Kalariya, Ratilal Girdhar. **Comparison of Gyan Karam and Bhakti in the Ishavasya Upanishad and Shreemad Bhagavad Geeta**. (Dr. Parsotam V Barasiya), Department of Philosophy, Bhakta Kavi Narsinh Mehta University, Junagadh.
4. Vaghela, Pareshkumar Narendrabhai. **The Advaiti philosophy of Akha and its relevance to the present time**. (Dr. Parasotam V Barasiya), Department of Philosophy, Bhakta Kavi Narsinh Mehta University, Junagadh. ❑

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The Dayalbagh Educational Institute is a Deemed to be University under Section 3 of the University Grants Commission Act, 1956 as per Notification No. F.9-3/78-U-3 dated 16.5.1981 issued by the then Ministry of Education & Culture, Government of India. The Institute has six faculties, viz., Arts, Commerce, Education, Engineering, Science and Social Sciences besides a Technical College and a centre offering certificate level modular programmes. Applications are invited for admission to various programmes/courses listed in the table below for the session 2024-25.

Note: (1) For any clarifications, regarding details of (I) Eligibility Criteria (ii) No. of Available Seats (iii) Admission Criteria (iv) Mode of Selection (v) Fee details (vi) Reservation Policy and (vii) Procedure for applying for admission etc., please refer to the Institute prospectus at the DEI website http://www.dei.ac.in (2) All CGPA be converted to percentage of marks for all purposes.

(1) B.A. (Hons.) in Arts, B.F.A., B.A. Social Science (Hons.), B.A. Soc. Sc. (Cognitive Science) Hons., B.A. Soc. Sc. (Human Service Management) *, Bachelor of Arts (Honours)-Social Science in Sociology (Online mode), B.Sc. (Cognitive Science)*, B.Com. (Hons.), B.Com. Hons. (Accounting)*, B.Com. Hons. (Corporate Accounting & Law), B.B.A. (Hons.), B.B.A. Hons. (Logistics), B.B.A. Hons. (Retail Specialization), B.Sc. (Hons.) Physics/Chemistry/Mathematics/Computer Science: For candidates with PCM subjects at Intermediate (10+2), B.Sc. (Hons.) Botany/Chemistry/Zoology: For candidates with PCB subjects at Intermediate (10+2), B.Sc. (Hons.) Applied Botany Science: For candidates with PCB subjects at Intermediate (10+2), B.Sc. (Hons.) Home Science, B.sc. (Hons.) Sustainable Community Science, B.Sc. Agriculture (2) B.Tech (a) Agricultural Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, Footwear Technology (b) B.Com./B.B.A. Combined Degree with B.Tech. Footwear Technology (c) B.Tech.(Part-time) in Electrical Engineering (d) Bachelor of Architecture (3) Bachelor of Homoeopathic Medicine and Surgery (BHMS)# (4) B.Voc. in (a) Apparel Design (b) Textile (c) Dairy Technology (d) Food Processing (e) Tourism and Hospitality Management (f) Commercial Arts (g) Pottery and Ceramic Design (h) Accounting and Taxation (i) Banking & Finance (j) Bamboo & Wood Technology (k) Recycled Craft Design (l) Renewable Energy (m) Automobile (n) Telematics (o) AI & Robotics (p) Internet of Things (q) Telecommunications (r) Digital Manufacturing (s) Water Sanitation and Waste Management (t) Agriculture Technology (u) Greenhouse Technology (v) Management and Manufacture of Homeopathic Drugs (w) Management and Manufacture of Ayurvedic Drugs (5) Diploma in Elementary Education (D.El.Ed.) (6) B.Ed. (7) M.Ed. (8) M.Voc. in Apparel Design / Textile / Automobile / Food Processing / Dairy Technology / Renewable Energy (9) (a) M.Com. with or without specialization in International Business (b) P.G. Programme M.B.A. / M.B.A (General Management) / M.B.A. (Agricultural Management) / M.B.A. (Innovation) / M.A.Social Science (Business Management) - to be offered at project sites / Online PG Certificate in Financial Services (PGCFS) / Online PG Certificate in Career Progression for Working Professionals(PGCCPWP) (c) P.G. - M.B.A. INTEGRATED PROGRAMME: INTEGRATED M.B.A. PROGRAMME: with PG Degree/PG Diploma – to be taken along with a relevant PG degree/diploma (10) (a) M.A. in Hindi / Sanskrit & Culture / Drawing & Painting / English / Music (Sitar / Tabla / Vocal) / Theology, (b) M.A. (Social Science): Psychology / Political Science / Sociology (11) M.Sc.: Home Science with or without specialization in Human Development, M.Sc. in Botany with or without specialization in Plant & Microbial Biotechnology / Chemistry / Computer Science / Mathematics with or without specialization in Computer Applications / Physics with or without specialization in Electronics or Computer Science / Zoology (12) (a) M.Tech. in Engineering Systems (Full Time / Part Time) (b) M.Tech. in Engineering Systems (Full-time) with specialization in Computer Science (13) Ph.D. (Full-time / Part-time) (14) (a) PG Diploma in Theology / Devotional & Folk Music / Journalism & Mass Communication / Safety, Health & Environment / Textile Designing & Printing / Business Economics / Human Rights and Social Work (b) PG Diploma in Urban Planning and Management (c) PG Diploma in Computer Science & Applications / Big Data, Logistics & Operations Research (d) PG Diploma in Environmental and Green Technology (15) (a) Diploma in Engineering in Automobile / Electrical / Mechanical / Electronics / Civil / Architecture Assistantship / Leather Technology & Footwear (CASD) (b) Vocational Diploma in Automobile / Information Technology (c) Dual Diploma - Degree Program: Vocational Diploma in Information Technology with B.Sc. Computer Science (16) Diploma in Polytechnic in Textile Designing / Interior Designing & Decoration(17) Diploma in Polytechnic in Garment Technology (18) Diploma in Polytechnic in Modern Office Management & Secretarial Practice

(19) Certificate Programmes based on Modular Format [2-semesters or 4-semesters] or [4 Modules or 8 Modules] : Modern Office Management & Secretarial Practice / Office Assistant - Cum - Computer Operator / Pre-School Teacher Education / Textile Technology / Motor Vehicle Mechanic (2-Wheeler / 4-Wheeler) / Electrician / Fitter / Turner / Dress Designing & Tailoring / Food Processing Preservation & Nutrition / Interior, Exterior Designing & Decoration / Textile Designing & Printing / Nursing Aide (Advanced Certificate of 3 semesters Duration) / Electronics Mechanic / Installation & Maintenance of Solar Electric Systems / 3-D Printing / Electric Vehicle Service Technician / Cutting & Sewing / Welder / Wireman / Plumber / Mason (Building Constructor) / Mushroom Technology / Online Certificate in Soft Skills for Success in the Work Place (CSSSW) / Online Certificate Course in School Mathematics for Everyone (CCSME) (20) Distance Education Programmes at Post-Graduate, Graduate, Diploma, Certificate and modular levels are offered in Distance Education / Synchronous mode also. Refer to Section D of DEI Prospectus.

***Trans disciplinary Programmes (TDP)**

**** Graduate refers to 3 years degree course under 10+2+3 system.**

 # Subject to the recognition of the Programme from appropriate Agency.

NOTE : (1) Program Duration for various courses will be in accordance with the NEP 2020. (2) Reservation in admissions is applicable as per the Government norms. (3) For relaxation of marks for various categories and maximum age limit for various programmes, refer to the Institute Prospectus. (4) At present, various programmes for admission are open to selected categories of candidates, viz., only for female candidates or only for male candidates and for candidates belonging to all genders. For details, refer to the Institute Prospectus. (5) For all other details refer to the Institute Prospectus.

The last date for submission of online applications complete in all respect shall be as mentioned below:

(a) For Diploma / All Undergraduate / B.Voc. / B.F.A. / B.Arch. & B.Tech.

Courses: **-25th May 2024** (b) For B.Ed. / M.Ed. / M.Voc. / All Postgraduate & Postgraduate Diploma Courses: - **25th May 2024**

Vocational Certificate Programmes:

Online Applications shall start from: 10th June 2024

The last date for Online Submissions:**10th July 2024**

Schedule of the Admission Tests/Interviews shall be notified separately on the DEI website (www.dei.ac.in).

The results of Shortlisted Candidates for counselling and admission will be notified on the DEI website (www.dei.ac.in).

April 28, 2024 **Ph :(0562) 2570372** **REGISTRAR**

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