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A **Special Number of the University News** on the theme ***'Higher Education@2047'*** is being brought out in the Month of March, 2024.

The **Special Issue** will cover the articles of eminent educationists on the afore-mentioned theme. Readers of the University News are also invited to contribute to the Special Number by submitting papers/articles on the above theme by **March 15, 2024**. The papers will be published in the Issue subject to the approval of the Editorial Committee of the University News. The contributions are invited on the following Subthemes:

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- Using Bhartiya Knowledge System-based Approach for Teaching-learning for Holistic Development.
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- Embedding Bhartiya Knowledge System for Futuristic Education.
- Ancient Bharatiya Wisdom in Modern Context: Everlasting Relevance of Indian Knowledge System Heritage for Human Development.
- Return of the Vishwa Guru Status: Strategies to Maintain and Propagate Ancient Indian Wisdom for Global Welfare.
- Embedding Indian Traditional Knowledge into Advanced Scientific Research and Futuristic Technology to Optimise the Advantages.
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- Global Higher Education Policy and Regulation: Harmonizing Standards.
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The Educational Philosophy of Mahatma Gandhi and Its Implications for Content and Practice of Education

Purnima Pandey* and Deepa Mehta**

Mahatma Gandhi is well known and famous all around the world as the true worshipper of non-violence and political ethicist, but above this, he was a great teacher and role model who had infused the fundamental aims of education at the physical, mental, intellectual, and moral level. The concrete form of his philosophy of education is represented in the model of Basic Education. Keeping at the centre of the social crisis and problems of India, he presented his educational philosophy with positive modification at the new horizon. This paper highlights Mahatma Gandhi's educational philosophy, his views on the aims of education, teacher, student, curriculum, women's education, adult Education, and different aspects of education.

Philosophy of Education

Mahatma Gandhi's educational philosophy, which is the integration of Idealism, Naturalism, and Pragmatism, was focused on practical as well as moral and spiritual aspects of life. We can get glimpses about his philosophy of education in these lines, which were written in the Harijan by Gandhiji: *"By education, I mean an all-round drawing out of the best in child and man-body, mind and spirit, Literacy is not the end of education or even the beginning. It is only of the means whereby man and woman can be educated. Literacy in itself is no education. I would therefore begin the child's education by teaching it a useful handicraft and enabling it to produce from the moment it begins its training. I hold the highest development of the mind and the soul is possible under such a system of education. Only every handicraft has to be taught not merely mechanically as is done today but scientifically, i.e. the child should know the why and the wherefore of every process."*

(India of My Dreams, pp 156)

The above lines depict the integrated principle of Mahatma Gandhi, in which 'body, mind and spirit' indicate the practical, scientific, moral, and spiritual development of human life. His philosophy of education has both, philosophical and practical approaches. For him, education is not only a means of information-gathering or an indication of literacy but it fulfills our basic needs, provides economic strength, as well as it develops our scientific and logical faculties in a constructive mode, and inculcates moral and humane values in our behavior. Through education, the development of the soul is possible, because education does not only skill or train our hands and minds, but it shapes and reforms our spirit to make us moral, humane, and spiritual.

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Aims of Education

As Mahatma Gandhi's educational philosophy has a harmonious and integrated foundation, his vision of the aims of education was enfolded with the same resolutions. According to him, education cannot have a single aim. He described about the aims of education according to the different needs and importance of human life. Therefore, his views on educational aims can be divided into three folds: (1) Individual Aim (2) Social Aim (3) Ultimate Aim.

Individual Aim

According to Gandhiji, education should be helpful in the process of an individual's all-round development i.e. development of body, mind, and spirit. Further, character-building is the main aim of education. He believed that meaningful education flourishes moral values in the deepening heart of students. He emphasized the character building of students in these lines, *"Knowledge without character is a power for evil only, as seen in the instances of so many 'talented thieves' and 'gentlemen rascals' in the world."*

(India of My Dreams, pp 130)

Therefore, in the vision of Gandhiji, education is wasted, which is a failure to develop good manners and noble conduct in the students. Considering this viewpoint, it is being felt that the present education system and curriculum should be designed and developed on the foundation of Mahatma Gandhi's *'eleven vows'*. These *'eleven vows'* are- *Satya* (Truth), *Ahimsa* (Nonviolence), *Asteya* (Non Stealing), *Brahmacharya* (Self Discipline), *Aparigraha* (Non-possession), S*harirshrama* (Bread labour), *Aswada* (Control of the palate), *Sarvatra Bhayavarjana* (Fearlessness), *Sarva Dharma Samantva* (Equality of all religions), *Swadeshi* (Use locally made goods) and *Sparshbhavana* (Remove untouchability).

Social Aim

For Mahatma Gandhi, the aim of education should be centered on developing productive abilities and work skills in students, because knowledge and work should not be taken apart. Knowledge and work, both are interlinked and helpful in the development of society and country. Considering the issues related to poverty and unemployment in India, he suggested that everyone should become economically strong and self-reliant so that we can fulfill our basic needs. He believed that the aim of education should be accordingly useful to the needs and demands of our society.

Ultimate Aim

According to Mahatma Gandhi, the ultimate aim of education is to know God and self-realization. This aim is not only the ultimate aim of education, but also the real purpose of human life i.e. freedom from all worldly desires and things. Other aims of education are immediate, but this is ultimate and spiritual. Gandhiji's spirituality did not end at a personal level only. He wanted to include the whole society in his spiritual efforts and so he advised everyone to inculcate the **'**eleven vows' or 'eleven *vratas*' in his or her life. The 'eleven vows' are a bunch of moral and spiritual values, by which one can achieve the ultimate aim.

Teacher

According to Mahatma Gandhi, "All teachers should be men of character." He emphasized the quality and conduct of a teacher because teachers are the ideals of their students. Their behavior and personality lay a path of direction to their pupils. In the words of Gandhiji, "*I know that some of the teachers too do not lead pure and clean lives. To them, I say that even if they impart all the knowledge in the world to their students but do inculcate not truth and purity among them, they will have betrayed them and instead of raising them set them on the downward road to perdition".*

(India of My Dreams, pp 130)

Therefore, a teacher should be pure, knowledgeable, honest, generous, moral, punctual, and devoted to their work. Teachers' lives should be simple and pure. Teachers should treat their students friendly and genuinely. Gandhiji requested to the teachers *"to cultivate their hearts and establish with the students a heart-contact."* For simplicity and purity of teacher's life, Gandhiji suggested, *"Teachers should be paid not very high salaries but only a living wage. They should be inspired by a spirit of service."*

(India of My Dreams, pp 168)

Student

In the vision of Gandhiji, students are the future–creator of our country, so they should have knowledge, self-discipline, good virtues, morality in their conduct, faith, sincerity, righteousness, honesty, purity, and brotherhood. He appealed to the students, *"boys and girls, to keep your mind and bodies pure. All your scholarship, all your study of the scriptures will be in vain if you fail to translate their teachings into your daily life."*

(India of My Dreams, pp 129-130)

Students are free to ask their doubts without any fear, but they should respect their teachers. Besides bookish knowledge, students should learn good qualities and develop their personalities by participating in different activities like playing sports and games, yoga, prayer, handicrafts works, manual work, agriculture-work, painting, singing, etc. They should use their knowledge and skills in their practical life for the betterment.

Curriculum

It was Gandhiji's great wish that the school curriculum should be full of life and creativity, by which our students who belong to different communities, regions, and village areas can correlate themselves. In addition, they can also become self-reliant and economically independent by learning different skills and work. The curriculum proposed by Gandhiji was structured on the principle of '*sarvodaya',* which means *'universal uplift'* or *'progress of all'.* Therefore, to establish a new rising India, Mahatma Gandhi practically depicted the recommendations and suggestions of education in the form of Basic Education. The goals are centered not only on its productive utility but also on its lifelong value-based applicability. Mahatma Gandhi described the training of basic education in these lines, *"In my scheme of things the hand will handle tools before it draws or traces the writings. The eyes will read the pictures of letters and words as they will know other things in life, and the ears will catch the names and meanings of things and sentences. The whole training will be natural, responsive and, therefore, the quickest and the cheapest in the world."*

(India of My Dreams, pp 156)

The model of Basic Education is enriched with experience and skill-based learning. Some major activities and productive works are testing, demonstration, laboratory works, handicraft works based on local needs, spinning and weaving, embroidery, manual works, agriculture-work, gardening, sewing, cooking, mass prayer, cultural programmes, teamwork, painting and music, watering plants, carpentry, leatherwork, clay modeling, bamboo crafts, hygiene, and health-based Program, cleaning, physical activities, yoga, P.T., drill, games, and sports. Through these activities, virtues like tolerance, self-reliance, team spirit, mutual understanding, industriousness, patience, use of locally made goods, fearlessness, collaboration, courage, social adjustment, and social skills, can be developed in students.

Some important subjects and sub-topics have been recommended to teach at different stages of students' lives. These subjects are - Hindi, Urdu as the national language, Mathematics, Social studies, General knowledge, General science, Hygiene and Health Programme, Indian cultures and heritage, Indian history, world history, Geography, Zoology, Botany, Astronomy, Arithmetic, Geometry, and Algebra.

Gandhi emphasized that the mother tongue should be the medium of teaching. When a child receives an education in the mother tongue, he or she can associate himself or herself with the learning process effectively. Describing the importance of mother tongue, Gandhiji shared his own experience, *"when I became a Barrister, I may not speak my mother tongue, and that someone else should have to translate to me from my language? Is not this absurd? Is it not a sign of slavery?"*

(Hind Swaraj, 1958)

Teaching Method

The teaching method, which was proposed by Mahatma Gandhi, was **an** integrated method**.** For him, **'**life' and **'**education' are not separate. Education should continue throughout a person's life. Therefore, school environment should be integrated with the social surroundings. The curriculum should be taught with the integration of natural and social atmosphere. For example, some concepts of Social studies can be taught on the occasion of national and religious festival celebrations. Mathematics can be taught by providing problems in real settings of society, which are practical and useful in daily life. Besides this, scientific methods, learning by doing, learning by experiences, lecture method, story-telling method, introspection method, self-study, demonstration, speculation, etc are the methods and tactics, that are directly or indirectly used in the basic education scheme.

Mahatma Gandhi's Views on Different Aspects of Education

Mahatma Gandhi not only emphasized the qualitative education of the primary level but he had also drawn our attention towards the different aspects of education. He disliked the present system prevailing in higher education because; the Indian universities and colleges are blind followers of foreign countries. They are far from the actual need of the country and unable to give practical experiences. He complained,

"*I am against the type of higher education that is given. It is much cry and little wool. The whole system of higher education and for that matter all education needs radical overhauling."*

(To Students, 1953)

Gandhiji wanted that higher education should be based on the educational policies related to national necessities. Universities and colleges should give practical and useful knowledge by which students can learn different works. He suggested that the engineers should be attached to the different industries where they should train the graduates. In the different fields of industries like art, medicine, commerce and agriculture, students should be trained practically in a similar way.

Mahatma Gandhi supported women's education and co-education**.** He suggested that women should be treated equally in the society. They should have the right to get an education and develop their personality. He also favored co-education in schools. He believed, *"Boys and girls should grow together freely and naturally. The co-education will come of itself."*

Discussing adult education**,** Gandhiji suggested that adults and villagers should be aware firstly of their country, general knowledge, culture, heritage, social challenges, political issues, and national and international facts so that they could be able to know about their country and understand the good and evil impacts of foreign countries. He was totally against giving them bookish knowledge, which would be of no use to them. He believed that India is an agricultural country, so villagers should be aware of the facts related to agriculture, cultivation, village geography, and village history. In addition, practical mathematical knowledge like- add, subtraction, reading and writing letters, and health, and hygiene-related basic knowledge, which may be useful in their daily life should be given to them.

Conclusion

Mahatma Gandhi, as the Father and Teacher of our nation pointed out some important issues related to educational challenges and problems prevailing in India. Keeping at the centre of these issues, he introduced the model of basic education and discussed his philosophy of education at the practical level. He advised that education should be very productive in developing the process of a better society and responsible citizen. Our schools should not only be the centre of transmitting theoretical knowledge, but also they should be the training pivot for making our students moral, generous, humane, productive and useful for the society. As Education is a major tool to build up moral character of students, and make them self-reliant and economically strong. Therefore, there are great social and ethical responsibilities on educational institutions. In the words of Gandhiji, *"Man is neither mere intellect, nor the gross animal body, nor the heart or soul alone. A proper and harmonious combination of all the three is required for the making of the whole man and constitutes the true economics of education."*

(India of My Dreams, pp 156)

The development of *'body, mind and spirit'* is the key feature of his educational philosophy. His educational thoughts were not hypothetical, rather they were highly practical, lively, utility-based and applicable to the grassroots level. They were based on the Indian cultures, villages, and different aspects of various communities and their life. In a nutshell, it can be said that Mahatma Gandhi was a modern educationist and philosopher, who had farsightedness regarding the upcoming developments and structure of India since 100 years ago. Gandhiji was highly concerned regarding the challenges and problems India had to face after independence. He suggested various recommendations, suggestions and developments for handling future issues. Today, the problems of unemployment, migration to the city and social imbalance have arisen due to the closure of many small-scale industries (such as industries related to cutting, weaving, sewing, handloom, jute, khadi, clay toys, pottery, etc). Therefore, it is necessary that Mahatma Gandhi's educational philosophy, ideas and 'eleven vows' should be adopted in the current education system in the form of curriculum and other learning experiences.

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An Understanding of Indian Knowledge Systems

M S Kurhade*

"Philosophy of values is the philosophy of life too. Indian philosophical systems are essentially the philosophies of values. So, they naturally suggest a way of life."

-S G Nigal

The purpose of this article is to enhance an adequate understanding of the Indian Knowledge Systems (IKS), which symbolizes an ancient Indian philosophical wisdom to utilize the great sages philosophical insights for the development and enhancement of human welfare when amid Artificial Intelligence (AI), Machine Learning (ML), material abundance and technological luxuries, man is leading a physically, mentally and emotionally mystified, unhappy and dissatisfactory life by mistaking sensual pleasure for happiness due to ignorance. The unique feature of ancient schools of Indian philosophy viz; Orthodox Schools – *Purvamimānsā; Uttaramimānsā (Vedanta); Nyāya- Vaisesika; Samkya-Yoga*; and three Heterodox Schools – Jainism; Buddhism and Cārvāka is that they search into very precise nature of reality, the structure and function of the human psyche and how the relationship between the two has important implications for ultimate human welfare.

Max Müller in his Cambridge University lectures says, "There is an unbroken continuity between the most modern and the most ancient phases of Indian thoughts extending over more than three thousand years." He adds that anyone who wants to write the story of world civilization, will have to take note of the Vedas. He categorically remarks, "I maintain that for a study of man, or if you like for a study of Aryan humanity there is nothing in the world equal in importance with the Vedas." It means India is the most ancient nation with a continuity of great culture. The greatness of our culture, due to which India was known as '*Vishwaguru*', lies in Vedic philosophical values. Vedas played a great role in developing the spiritual wealth of India. The contribution of sages in building this unique nation through Indian Knowledge Systems (IKS) is well known. The Vedas are the origin of the vast and rich Indian Knowledge Systems. In the thematic session on Indian Knowledge Systems (IKS), the Ministry of Education, Government of India, states:

"The National Education Policy ---2020 (NEP-2020) recognizes this rich heritage of ancient and eternal Indian knowledge and thought as a guiding principle. The Indian Knowledge Systems comprising Jnan, Vignan, and Jeevan Darshan have evolved out of experience, observation, experimentation, and rigorous analysis. This tradition of validating and putting into practice has impacted our education, arts, administration, law, justice, health, manufacturing, and commerce. This has influenced classical and other languages of Bharat, which were transmitted through textual, oral, and artistic traditions. "Knowledge of India" in this sense includes knowledge from ancient India and, its successes and challenges, and a sense of India's future aspirations specific to education, health, environment and indeed all aspects of life." *(https://www.education.gov.in/nep/indian-knowledge-systems)*

Right from the ancient period till date, the discussion about our pragmatic, scientific, and spiritual world is incomplete unless the contribution of great sages propounded in their Indian knowledge schools is not discussed. Of course, it proves that the Indian society in the Vedic ages was the most advanced and civilized in the world. Therefore, Max Muller said, "If I were asked under what sky the human mind has most fully developed some of its choicest gifts, has most deeply pondered on the greatest problems of life, and have found solutions to some of them which will deserve the attention even of those who have studied Plato and Immanuel Kant I should point to India."

The uniqueness of our country is that the Indian philosophical thought, culture, and religion are embedded together in this land. Monier Williams observed in 1875, "India in all its immutability, is now making such rapid strides in education that a Professor of Sanskrit at Oxford if he is to keep himself up to the level of advancing knowledge and attainments, ought to communicate personally with some of those remarkable native Pandits whose intellects have been developed at our great Indian colleges and universities, and who owe their eminence

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in various branches of learning to the advantages they have enjoyed under our government." What a visionary that he was, we are reiterating the same with the advent of the National Education Policy (NEP). The culture and aesthetics of our land need to be recognized by us first and feel proud of the same. Our literature is huge and spreads in a gigantic way. Poetry in all its forms, stories, narratives, dialogues, and debates, has passed on the richness of our land penning from passionate writers. Indian at is all time revered and admired across the globe. Today, we find modifications and variations of Indian art, music, dance, and yoga in every possible land in this world being admired and incorporated.

The antiquity of philosophical traditions has been stunning even today. Vedas which are *apourasheya* –not penned by any human are held to be sacrosanct and holy. It is the imperishable word breathed out by God Himself: *Yasya Nisvasitam Vedah yo Vedebhyo khilam Sagat, tam aham niramame vande vidyatiratha mahesvaram'*. In this Sanskrit verse, Sayanacarya has rightly pointed out the traditional view about the Indians' regard for the Vedas. Thus, the world is said to have emerged from the Vedas. The Vedas are accepted to be of divine origine and, therefore, finally authoritative at least in matters spiritual and super-rational. Hiriyanna, (Indian Conception of Values, Kavyalaya, 1975) says, "Though the higher values may be brought clearly into man's consciousness only later and may, therefore, be genetically posterior, they are logically prior. This is the significance of discovering the Vedas which reveal them, as beginningless (Anandi)". It is because of this Bal Gangadhar Tilak, in 'Arctic Home in the Vedas' (Poona. Tilak Bros; 1925), said, "For all practical purposes the Vedic religion can be shown to be beginningless even on strict scientific grounds."

The Vedas are the oldest and the richest source of Indian Knowledge Systems based on spiritual knowledge. The Vedas are four in number. They are: *Rig Veda,Yajur Veda, Sam Veda, and Atharva Veda.*

Vedas were not written by anybody-that, they are ageless and authorless. When we say 'Rig is a Veda', or, 'Yajur is a Veda', we do not mean that 'Rig' is a book or 'Yajur' is a book. Actually, a Veda contains so much material that each of them can fill a library! There is no power other than the power of Vedas that can take us close to the heart of God and connect us to Him in ways that we cannot even imagine. The love of the Divine, Beauty, Truth, and Goodness is inherent in all human souls, and the desire to attain it too. The sage's life is the spiritual embodiment that inspires them in their endeavours. Bishop Thomas Dabre (Vasai Diocese), delivered a lecture on 'Education for Peace', January 2005..... Sant Tukaram says, "Holy people live for the welfare of the world. They spend themselves laboriously with an intense sense of charity. Compassion for the beings is their wealth. They do not care for themselves. They rejoice with those who rejoice. Devotees of God see God in the world. For them discrimination is unholy. Let there be no contempt for any living being. This is the secret of worship of God. We are all members of one body." Sages come to terms with their life on the earth and use it as inspiration for their passionate literary outpourings. The first literature is to be found in the hymns man sang spontaneously to God. 'The spiritual emotion roused to a high pitch by the recitation of the hymns of praise (stotras) which are regarded as the most tangible form of worship'. The purpose of the hymns is qualities of God, glorification of the divine, and stories about supreme personalities. Stotras offer scope for individual initiative and genius. The account of such great hymns depicting high levels of devotional fervour shall remain incomplete without the mention of Indian knowledge systems.

Providence has indeed destined India to be the mother of the ageless teachings of Vedic sages, seers towards the promotion of human values. A cultured, knowledgeable mother, India went secular so that the people may be able to come closer to one another mentally, emotionally, intellectually, and spiritually; and live together peacefully in a binding spirit of brotherhood and humanity. Therefore, Swami Vivekananda's message is remembered here as, 'Be a man'. As he said, his religion was man-making. According to him, all religion teaches us the same thing, so in essence, they are one. Different religions are merely different ways of teaching the same reality; they are different modes and methods of teaching the same goal. All religions according to him are laid on charity, truth, and tolerance. He believes in that religion which elevates the man both physically and mentally".

The sages of the *Svetasvataropanishad* advocated that each man, each living organism on earth is potentially to the innate ideas which can be

verified by reason (*prajnanam*). They said "*Srnvantu Sarve Amrtasya Putrah*". Therefore, all men, are the children of Supreme Bonum i.e. Divine Father - God. As the children of such a noble Mother, we should follow the fundamental principles of human life enshrined in ancient scriptures. The sages are the living embodiments of divinity. They are the true wealth of society. Their teachings have always been a beacon to the human journey on the righteous path. They followed the method with an unflinching scientific attitude known as 'neti neti' (Not this, Not this). Logical reasoning is the guiding force of this Indian knowledge school. So, India's heritage of religion and philosophy has been a treasure of sages who have made their names immortal and left footprints on the periods of Indian culture. Mcdonell says "Owing to a remarkable continuity of Indian culture, the religion and social institutions of modern India are constantly illustrated by those of the past". Vedic culture aims at Abhyudaya (material prosperity) as well as Nihsreyas (spiritual liberation or beatitude),Preyas (the pleasant, the useful), and the Sreyas (the beneficial, the good).

***Vasudhaiva Kutumbakam* (World Family)**

Venas tat pasyan nihitam guhāsad
Yatra Visvam bhavanti ekanidaṁ
Tasminnidam saca vicaiti sarvaṁ
So otahprotoh ca vibhu prajāsu

- Yajurveda.

(The loving sage beholds that Being hidden in mystery, wherein the universe comes to have one home. Therein unite and therefrom emanate all. The omnipresent one is warp and wood in created things). This verse beautifully and nicely expresses the concept of One World One Family (*Vasudhaiva Kutumbakam*). This idea of universal fellowship can be realized only based on the spiritual unity of all existence. Sages and mystics have always set this ideal before the people. To the Vedas, the most ancient literature of the world goes the credit of visualizing the concept of one-world society on the firm foundation of philosophy of spirituality, Veda says, *Adinah syāma śaradàh śatam.* (May we live for a hundred years with our heads held high).

The noble ideal of family concord, later on, became a great ideal for the whole of humanity in the concept of *Vasudhaiva kutumbakam*. The whole world must become a global family. This ideal of world unity and concord can be traced to the Vedic ideal of family concord which is nicely placed before us by the Atharvaveda. The three verses of the hymn are given below:

"I will make you of one heart, of one mind, free from hate.

Love one another as the cow loves the calf she has borne.

Let the son be loyal to the father, and of one mind with the mother,

Let the wife speak sweet and beneficent words to the husband,

Let not brother hate brother, sister hate sister, unanimous, united in purpose speak you words joyfully".

[Atharvaveda III] [Translation of Atharvaveda by A. C. Bose in "The call of the Vedas", 3rd ed; Bombay, Bharatiya Vidya Bhavan, 1970].

The Vedas inculcate moral truth and dwell upon the importance of virtuous conduct. Atharvaveda records the prayer:

Budyemaśaradah Satam,
Puşema śaradaḥ śatam.

(May we know through hundred years and may we prosper through hundred years.)

In the *Taittiriya Araṇyaka*, there is prayer, "*Ajitah Syāma śaradah*" (Let us live unconquered for a hundred years). These prayers show that the Vedic morality and religion are vigorous and life-enhancing. Prayer is very much spiritual in nature and it strengthens the inner power of every human individual. History remarks that Roman preachers suggested prayers as a strong medium for meditation at Biblical Schools for the disciples. In Vedic culture, prayer is seen as a mandatory daily task for disciples. In praying we have an opportunity to combine the best of both karma yoga and bhakti yoga. From a spiritual perspective, it is good to pray with the right attitude for a righteous cause. Our prayers should be aimed at our spiritual welfare as well as the welfare of others. "O Divine Master, grant that I do not seek so much to be consoled as to console, to be understood as to understand, to be loved as to love; for it is in giving that we receive; it is in pardoning that we are pardoned, and it is in dying that we are born to everlasting life."

Prayer is essential for understanding God and for perceiving His existence through our body, mind, and intellect, praying to God at short and regular intervals makes it easier to establish communion with God. In Sanskrit language, the word for 'prayer' is *'prarthana'*. It is formed by combining words, *'pra'* meaning 'intensely' and *'artha'* meaning 'to plead'. A prayer includes respect, love, pleading and faith. Praying reduces anxiety and increases contemplation. "Pasayadan" (Gift of Divine Grace) by saint Jnyaneshwar (13th century) is well-known prayer for '*Vasudhaiva Kutumbakam':*

"Now, O' God, the entire Cosmos Divine! Be pleased with this pious word offering of mine||
Grant me in good will benign! Your Benevolent Grace Divine ||1||
May the evil minded, their wickedness shed|
May their intellect turn to pious and good deep instead||
May all living beings find themselves bonded|
By friendly ties of soul companionship ||2||
May the darkness of ignorant disappear|
May the universe see the Sun of self consciousness||
May whatsoever aspirations of those be fulfilled| Of all living beings ||3||
May shower all over the pious bliss Divine|
May the world be full of Saintly beings benign||
May incessantly in the Universe | Meet the living beings ||4||
Moving groves of wish granting trees|
Colonies of conscious wish fulfilling jewels ||
These saints are, speaking oceans |
Full of pious Nectorly Divine ||5||
A moon without a smear | A Sun without a hot sear ||
Always to one and all, these hallowed saints| Become kith and kin dear ||6||
Let all beings be completely satisfied and happy|
Fully contended in all the three world||
Engrossed and merged in devotion|
Eternally, of ultimate Divine ||7||
And those who live by this scripture Divine|
Eternally guiding all living beings||
Be victorious over seen unforeseen|
In this world and beyond ||8||
Here, said, the Lord of the Universe |
This shall become thy Grace Divine ||
And with this blissful Grace Divine |
Jnandeva became ever joyous and happy benign ||9||
(Source - *https:// kavyanubhav.blogspot.com/2011/ 10/ pasaydan-with meaning –in-english. html)*

Saint Jṅaneshwar and Saint Tukaram have accepted the final authoritativeness and divine origin of Vedas. Jṅāneshwar called Vedas the Mother Vedas and Saint Tukaram called,_____

Vedāṅcā to arth āmhāsica thāva,
Itarāni Vahāvā bhāra mātha.

(That only men like him know the true importance of the Vedas, others merely carry the burden on their heads). Therefore, Sarvepalli Radhakrishnan said, "The Marathi saints, Tukaram and Jṅāneśvar are great devotees of Vedantic philosophy. They say, Vedic & Vedantic philosophy is for those who are lost in ignorance and desire".

It is true that the Vedas speak the language of freedom from dependence, servility, disease and disability, humiliation and defects, etc. Hence, the well-known *Mrtyuṅjaya* Verse:

"*Tryambakam yajāmahe sugandhim pustivardhanam,*
Urvārukamiva bandhanāt mṙtyoh mukṣiya mā amrtat" (Ṛigveda).

Here, the sage wants to be freed from the clutches of death, but he does not want to be deprived of immortality.

Prayers for Divine Communication

Max Müller's view is that – "One of the highest praises bestowed on the Gods in the Veda is that they are Satya, true, truthful and trustworthy" *(Ṛigveda).* Prayer in its purest form is simple. It is a matter of concentrating one's entire intellect on God affirming a positive statement of truth, and meditating on divine principles. In the *Bhagavadgita,* God gives us the assurance that His devotees, who are immersed in the thoughts of Him and soaked by intense devotion to Him are freed forever from the bonds of mortal life. Prayers align our hearts and minds with the highest purpose of our lives, which is the salvation of self-realization. Through prayers, you express your love and devotion to God. Your prayer may be entirely your creation, weaved by the love of your heart, or taken from a scripture. We can change our lives and our destinies, using the power of prayers. Even the most difficult tasks can be performed with confidence when we unite the spiritual power of our prayers with the power of our intentions. Prayers not only purify the people who pray but also those in the vicinity. We pray for surrendering ourselves to God completely.

"Think of God more often than you breathe", said Epictetus the Stoic. It is true that in the Vedas a definite outlook towards life is given. Therefore, Prof. S G Nigal in his famous book 'Vedic Philosophy of Values' said 'The *Gāyatri Mantra* is an example of this approach of life. The *Gāyatri Mantra* has retained its greatness and power of its glory and sanctity from Vedic times to the present day'.

From very ancient days prayer is considered as the medium of harmonious relationship maintained by people with Almighty. When crisis comes and everywhere misery occupies the places, people do the performance of an act of conveying to recover from such cases through the vocal or mental communication with their beloved deities. These communications are done either through the act of worship on special occasions or by action during everyday work. Ancient Indian and Greek civilizations carry the history of such activities performed daily in morning and evening as prayers for Divine communication. Swami Vivekananda illustrates the same as:

"*When I asked God for strength,*
He gave me difficult situations to face.
When I asked God for Brain and Brown,
He gave me puzzles in life to solve.
When I asked God for happiness,
He showed me some unhappy people.
When I asked God for wealth.
He showed me how to work hard.
When I asked God for favours,
He showed me opportunities to work hard.
When I asked God for peace,
He showed me how to help others.
God gave me nothing I wanted,
He gave me everything I needed".

Research has thrown light on what makes prayer measurably useful to human beings, especially in the present era when whims and impulsiveness come at the cost of mental peace. Its dimensions set the way for self-reflection and also understanding of bigger things in life. Hence, prayer when done with the right attitude and intent can bring a lot to the plate for people, especially for youth whose intellectual capacity is hinged on their ability to embrace reality. Prayer can be a powerful force for change in our lives and the importance of doing it on a daily basis should be instilled in our children. Focus and concentration are the most vital outcomes of prayer.

"Be not afraid to pray-to pray is right.
Pray, if thou canst, with hope but ever pray,
Through hope be weak or sick with long delay;
Pray in the darkness, if there is no light,
Far is the time remote from human sight,
When war and discord on the earth shall cease;
Yet every prayer for universal peace,
Avails the blessed time to expedite.
Whatever is good to wish, ask that of Heaven,
Though it be what thou canst not hope to see;
Pray to be perfect, though material leaven.
Forbid the spirit so on earth to be:
But it for any wish thou darest not pray,
Then pray to God to cast that wish away".

- Hartley Coleridge

True, "More things are wrought by prayer that his world dreams of" but is prayer alone enough? Why then Zens, the Greek God admonish the chariot driver who prayed to Him when His chariot wheel was entrenched in a ditch? "Do you expect me to come to earth and give you a hand? Put your shoulder to the wheel", he said, "because God helps those who help themselves". "According to Vedic science, as the Supreme Creator creates the cosmos, the creative potency descends among the created beings to assist the Supreme Creator in the manifestation of the material worlds. So, it is believed that the Supreme expands Himself and also creates positions within the material cosmos which are taken by co-creators, or demigods who assist in creating and maintaining the material manifestation," said Acharya Mahapragya and APJ Abdul Kalam.

Sanatana_Dharma

Sanatan Dharma is a *dharma* of humanity that deals with human nature, ideas, thoughts, actions, performance, and spiritual search of God. It is eternal, perennial, and ceaseless. It believes that human beings have come into this world with four aims to pursue. Indian civilization has been enriched by the Maharsis, Ṛṣis, Sages and Saints.

The impact of Vedas, Upanishads, epic-Ramayana and Mahabharata on Indian culture has spiritually enriched the people. The aims of human life have been reflected as the values of life as Artha (Material need); Kama (Emotional need); Dharma (Ethical law); and Moksha (Spiritual aim). These four aims of life are known as the '*Purusharthas*'.

'*Kautiliya Arthashastra'* projects the 'Real Dharma' which is one that helps attain worldly progress and mental development. Dharma should make man wealthy and also make his humanity spotless. The essence of Arya Chanakya's '*Arthashastra*' is to lead human folks toward humanity, make society so secure and safe and prosperous.

Sanatana dharma is a way of life that has its roots in the wisdom enshrined in the ancient lore of the Vedas. It is called *Sanātanadhaṛmah* because it is eternal, without the beginning and without the end. "The eternal word, truth, wisdom or principle existed before the creation of the universe, and continues to function in guiding the creative process. He has created the Heaven and the Earth with Truth. What is meant by Truth? It is the eternally abiding Reality" said APJ Abdul Kalam. The term 'Veda' itself is derived from the root 'Vid'. It means both to 'know' and to 'obtain' or to 'attain'. Thus, it is both knowledge' and 'what is to be obtained through this knowledge'. So, it suggests ideals of life to be practiced in human life. Hence, even the 'Vedas', though revealed to the sages, were designated as '*Apauruseya*' (impersonal), not due to human efforts. The Vedic culture is an organic culture. It is live and vibrant and has contributed a lot to shaping the Indian ethos. It was called Sanatana dharma which according to Swami Bharati Krishna Tirtha (*Sanatanadharma, Bharatiya Vidya Bhavan*, 1970) means four things,

1. *Sanātanasya dharmah Sanatana dharmah* - It means the religion of, or the religion founded by the Eternal One, not by any person born subsequently.
2. *Sanātanah cāsau dharmaḥ Sanātana dharmah* – It is beginningless and endless and hence, Eternal.
3. *Sadā bhavah Sanātanah – Sanātanam Karoti Sanātanayati iti sanātanah Sanātanah cāsau dharmaḥ Saṅātanadharmaḥ* - This meaning gives us the value of *Sanātana dharmaḥ*. Its value lies in making eternal those who act according to its principles.
4. *Sanātanayati iti Sanātanah* – each one who acts according to the principles of *Sanātana dharmaḥ* realizes his True Self or becomes one with God (*Sanātanayati nāma Sanātanasvarāpam (param ātmasvarūpam) prāpayti).*

Sage Kanada defines *'Dharma'* as- "*Yato bhyudayanishreyasiddhih sa Dharma".* (That which leads mankind to prosperity, purity of heart, development of higher qualities and eventually attainment of self-knowledge and, is dhrama). These two aphorisms are the essence of Vedic Dharma i.e. *Sanatan Dharma* – Eternal Principle. The protagonists of this way of life is determined to turn the world into a single family- *Vasudhaiva Kutumbakam.* Sambanana, a Vedic saint in his hymn says, -

"Sangaccadhvam Sambadadhvam
Sam vo manasi janatam.
Deva bhagam yatha purve
Samjanana upasate".

(Go together, speak together and let your minds be of one accord, as the ancient divine personalities with one accord accepted their divine share).

Sage Jaimini, a saint of ancient India, whose Mimansa Sutra is the only base of Mimansa system of Indian philosophy has defined '*Sanātana Dharma'* as, - '*Codanalaksanortho Dharmah'*. (That, which is conducive to purification of heart, attainment of self-knowledge and liberation from the bondage of nescience, is Dharma). The 'Vedas' are the base of 'Dharma'. Rejection of forbidden acts and performance of prescribed duties are paramount.

Lord Sri Krishna assures the mankind in the celestial song,

"*Yadda yadda hi dharmasya*
Glanir bhavathi Bhaartha
Abhyuththanam adharmasya
Tadathmaanam srujamyaham."

(Whenever there is the decline in 'Dharma' divinity will incarnate to uphold and revive it.)

Indian Aesthetics and Culture

Indian aesthetics is a unique philosophical and spiritual point of view on art, architecture and literature. Our country is known for its rich culture, heritage, varied religious faiths, impeccable

philosophical systems, multi-languages and much more. It is a celebration of diversity. It has one of the largest collections of songs, music, dance, fine arts, theatre, folk traditions, performing arts, rites and rituals, paintings and writings that are known, as the 'Intangible Cultural Heritage'. A country as diverse as India is symbolized by the plurality of its culture. The culture gives an identity at the social level for engaging in cultural practices.

Every province of India, through the brilliant brains of its soil, has contributed to Indian art and aesthetics. It is referred as *Alankarasastra.* Every philosophical school of thought has added value to this *sastra* too. Dr. Ganesh says "Thus the materialism of Nyāya and Mīmāṃsā, unique psychic realism of Sāṅkhya and Yoga, moralistic realism of Jaina, transcendental realism of Śaiva and Vaiṣṇava, absolute idealism of Bauddha and Vedānta have enriched the resourcefulness of Indian Aesthetics." The four canons—*rasa, dhvani, aucitya,* and *vakrokti*—enable us to analyze emotional, psychological and intellectual activities that produce a work of art in some form or the other. It is indeed true that they bestow upon us the joy of art experience in totality.

Here, I remember one of the finest hymns to radiant Dawn (Rigveda 1.113) is the beautiful creation of Vedic poetry. This is hymns to Ushā the goddess of dawn, are the best specimens of imaginative power of human mind. Originally in Sanskrit language, translated by A A MacDonnell as,

"*This light has come of all the lights the fairest*
The brilliant brightness has been born, far shining,
Urged onward for God Savitr's uprising,
Night now has yielded up her place to Morning
The Sister's pathway is the same, unending:
Taught by the gods, alternately they treat it,
Fair shaped, of different forms and yet one-minded,
Night and morning clash not, nor do they linger
Bright leader of glad sounds, she shines effulgent,
Widely she has unclosed for us her portals,
Arousing all the world, she shows us riches,
Dawn has awakened every creature.
There heaven's daughter has appeared before us,
The maiden flushing in her brilliant garments,
That sovereign lady of all earthly treasure,
Auspicious Dawn flush here today upon us,
In the sky's framework she has shone with splendor.
The goddess has cast off the robe of darkness,
Wakening up the world with ruddy horses,
Upon her well-yoked chariot Dawn is coming.
Bringing upon it many bounteous blessings,
Brightly shining, she spreads her brilliant luster
Last of the countless mornings that have gone by
First of bright morns to come has Dawn arisen,
Arise, the breath, the life, again has reached us,
Darkness has gone away and light is coming.
She leaves a pathway for the Sun to travel.
We have arrived where men prolong existence".

Concept of *Vishwaguru* (Global Teacher)

"Great geniuses do not fit into an arrangement in serial on the basis of evolution. Great poets, scientists, and philosophers do not wait for their turn in the queue of evolution in their respective fields. Thus, there are great geniuses who have recorded their spiritual experiences in Vedic literature. They are always a minority, but a significant one". – C Kunhan Raja. India has a glorious tradition of spirituality propagated by a long line of 'rishis'. The teachings of the sages have an eternal relevance and unleashed the creativity of the Indian culture over a wide spectrum- literature, medicine, music, dancing, art, painting, sculpture, mythology, ethics, architecture, navigation, grammar, astronomy, mathematics, metaphysics, archeology, epistemology, teleology, astrology, ontology, yoga, philosophy, logic, psychology and economics. This explosion of creativity has enriched Indian culture and upliftment the human soul. From time immemorial, sages have shown the path of spiritual uplift and bliss to mankind and universal human values. Bharat Varsha, the Indian subcontinent, has been particularly blessed with many sages that have made this land a land of merit i.e. Punya Bhoomi. All the sages of India prayed and acted since Vedic period for peace, harmony and happiness. *'Loka Samastha, Sukhino Bhavanthu'*. That is why India has been '*Vishwaguru',* the guide for all humanity. Indians are rich in the teachings of sages. The teachings of sages are vast and it is of oceanic proportions. The meanings of Vedic texts is found in *Nirukta* (ancient literature). The tenets of scriptures are followed as the transcendental path of spiritual life. The authors of *Nirukta* are '*Yaska', 'Sthaulashtibi'* and '*Shakapuni'*. In 'Nirukta', 'rishi' means the person to whom the words belong.

Ancient India has produced some important works in the world of literature, notably Charak Samhita, the oldest treatise dealing with surgery is Shushruta's compendium, Susruta Samhita. Patanjali's 'Yogasutras', Kautilya's Arthasastra, Vyāsa's 'Mahabharata', Vatsyayana's 'Nyaya Bhasya' Gautama's 'Nyaya Sutra', Samkara's 'Vedanta Sutra', Ramanuja's 'Brahma Sutra', Baudhayana's contribution in mathematics, Aryabhatta's in astronomy and mathematics, Varhmihir in physics and Nagarjuna in chemistry, etc. have broadened our understanding through the teachings of such great sages. "They are regarded as the expression of a single mind, which has built up the great temple, though it is divided into numerous walls and vestibules, passages and pillars."

– S. Radhakrishnan

S. Radhakrishnan said, "The great teachers do not lay claim to originality but affirm that they are expounding the ancient truth which is the final norm by which all teachings are judged, the eternal source of all religions and philosophies, the *philosophia perennis,* the Sanatana dharma, what Saint Augustine calls the "Wisdom that was not made; but is at this present, as it hath ever been and so shall ever be."

India furnishes a number of most illustrious intellectuals, seer, sages, who had so developed their philosophical abilities, so brought into everyday life the powers of their intuitive consciousness, that they are seen to be constantly exchanging illuminations, intuitions, revelations with all.

Rationalistic systems of Indian philosophy like Sānkhyayoga and Nyāya-Vaisaṣika claim that they are based on the Vedas. Mimāmsā and Vedanta are known as Vedic systems. The writers of various Smrtis accept Vedas authoritativeness. The Smrtis represent human tradition. 'Smrti' means what is remembered. Aphorisms have significance in Vedic philosophy. They are short, meaningful, simple, clear, and distinct and it contain eternal truth. The Vedas represent the divine revelations. In the words of Swami Vivekananda, the expirations of the meditating sages, out of the heart of the sages, they sprang. There is no inspiration but expiration. All powers, purity and all greatness, everything is in the soul. They are the eternal laws being present in every soul. They contain the truths seen by the sages and seers in their transcendental states of meditation. They are intuitive truths, directly apprehended by the meditating sages."

Indian Knowledge Systems

The Indian Knowledge Systems grew out of the Vedas. They are known as Vedic or *Astika*- a systemized pattern of thought called a '*Darśana'* (philosophy). Each system is an intuition and formulation of Truth which is to lead to a way of life with the ultimate end of obtaining Liberation (*Moksa*) from mundane life bound by time and space and by cycles of births and deaths. Teleologically, the aim of human life is not only the pursuit of natural gains (Artha) and sensual pleasure (*Kāma)* but also virtue and morality which make us follow righteous path (Dharma) and spiritual enlightenment and liberation (*Moksa).* The final state is a realization of the Truth and its direct experience (*Anubhava*).

The Indian Knowledge Systems (IKS) associated with a sage as its first promulgator are shown in table 1.

Table 1: Indian Knowledge Systems

Sr. No.	Indian Knowledge Systems	Promulgators
1	The Mimāṁsā	Sage Jaimini
2	The Vedanta	Sage Bādarāyana-Vyāsa
3	The Sāmkhya	Sage Kapila
4	The Yoga	Maharshi Patanjali
5	The Vaisesika	Ṛsi Kanāda
6	The Nyāya	Ṛsi Gautama

The Indian knowledge schools are in the form of aphorisms (*sutras*) and understood with the help of Maharshi's teachings and traditions. Because of their mutual relationship, these six schools fall into three groups of alied systems, Samana- tantras. Samkhya and Yoga go together; the philosophical framework of Ṡamkhya is accepted by Yoga, with the addition of God as the omniscient first Teacher. The specialty of 'Yoga' is the practical aspect of the methods of mental control by which the philosophical ideal of the *Ṡamkhya,* namely, the isolation (Kaivalya) of the spirit from Matter is achieved. The *Vaiśesika* doctrine form the basis of *Nyāya,* both being schools of realism and pluralism. The specialty of *Nyāya* lies in its further treatment of logic and the science of debate. The Mimāṁsa and Vedanta go together because of their common Vedic basis but otherwise, they differ fundamentally. The former is concerned with 'Karma' and 'Dharma', the performance of ordained duty, but the latter to the opposite of karma, namely, renunciation of activity.

Dr. S Radhakrishnan aptly said, "Vedic utterances are endless in their suggestiveness". Vedas can be interpreted literally as well as allegorically or symbolically. In ancient times, there was freedom to interpret them. Hence, we come across more than 100 Smritis. (S. Radhakrishnan, Religion and Society, London, George Allen & Unwin, 1947). Vedic philosophy developed in different centres and it was summed up in the Sutras. They are not the work of one sage or of one age but of many sages spread over a number of generations.

The Indian Knowledge Systems are known as the Brahmanical Systems, since they all accept the authority of the Vedas. Max Müller in his "Six Systems of Indian Philosophy", said "…… Whatever is the age when the collection of our Rigveda Saṁhita were finished, it was before that age that the conviction has formed that there is but One Being neither male nor female, a being raised high above all conditions and limitations of personality. In fact, the Vedic poets have arrived at a conception of the Godhead which even at present, is beyond the reach of many who call themselves Christians".

Nyāya System

This School's specialty is the application of logic and the science of debate. The logic is actual recognition of spiritual experience, which is recognized by the omniscient mind, that is all-encompassing and all pervading. It taught the science of precise thinking, came to be known as Pramāna Ṡastra. It gives us an account of the processes and methods of a reasoned knowledge of objects.

Aksapāda Gautama's "*Nyayasastra*" was called "*Hetuvidya"* or "*Hetuśāstra*". 'Nyāya' means logical reasoning which lead to the end to attain the desired result. According to Uddyotakara, the purpose of '*Nyāyasastra*' was to bring tranquility to world. S. Radakrishnan rightly said, "Every System of Hindu thought accepts the fundamental principles of the *Nyāya* logic, and even in criticizing the *Nyāyas* system, uses the *Nyāya* terminology and logic. The *Nyāya* serves as an introduction to all systematic philosophy."

Sage Gautama speaks of the importance of Sastra's knowledge for a *Brāhmana.* The followers of *Nyāya- Vaiśesika* School ware called 'Yogas' because of their affiliation to the *Pasupata Yogaśāstra*. The *Nyāyasūtras* main attribute is the attainment of Nihśreyas (The highest good) through the true knowledge of the fundamental principles. Therefore, it is called a moksa-sastra. According to Gautama the sources of knowledge are:

1. Perception (*Pratyakṣa*)
2. Inference (*Anumāma*)
3. Analogy (*Upamāna*)
4. Verbal Testimony (*śabda*)

The *Nyāya* believes in the search for truth through science of debate or the science of discussion. Therefore, intellectual discussion is called the breath of intellectual life. *Aksapāda Gautama* gave twelve objects of knowledge (*Prameyas*) they are Soul, Body, Sense-organ, Sense-object, Intellect, Mind, Endeavour, Defect, Rebirth, Enjoyment of the fruits of action, Sorrow and Salvation.

The *Nyāya* is a means by which the mind is led to a conclusion. It is equivalent to an argument, and the system followed to decide its validity is known as *Nyāya* system. Hence, Nyāya means right or wrong, so, *Nyāya* is the science of right reasoning.

Vaiśesika System

The *Vaisesika* is a treatise on the subtle, causal and atomic principles in relation to matter and other elements with spirit.

The *Vaiśesika* School forms the basis of *Nyāya,* both being schools of realism and pluralism. Sage Kanada the author of '*Vaiśesikadarśana'*, believes the objective world adds world has a real existence independent of the cogniser. It says substance is that which possesses qualities and actions and is the material cause of effects. There are nine substances, earth, water, light, air, *ākāśā*, time, space, soul and mind. The *Vaiśesika* is a philosophy of distinction. It is scientific, analytic, and it endeavors to formulate the general characters of the things observed. "*Vaiśesika* and the *Nyāya* agree in their essential principles, such as the nature and qualities of the self and the atomic theory of the universe, yet the classification and characterization of the categories and the development of the atomic theory give to the *Vaiśesika* its distinctive interest and values" said S. Radhakrishnan.

The Sāṁkhya System

Samkhya literally means 'numbers', but it is not a science that deals with numerology. It is a science of spirit that deals with the 24 attributes of our nature.

The *Sāṁkhya* and Yoga systems go together because the fundamental framework of *Sāṁkhya* is accepted by Yoga, with the addition of God as the Omniscient first teacher. The system believes in puruṣas and prakrti from the fact of knowledge. It assumes the distinction between the subject and object.

Richard Garbe said, "In Kapila's doctrine, for the first time in the history of the world, the complete independence and freedom of the mind, its full confidence in its own powers, were exhibited". *Sāṁkhya* attempt to attain a more rational conception of the world. It believes in the ultimate reality of homogeneous substance, which is indestructible, ubiquitous and eternal. So, Swami Vivekananda rightly said, "Every philosophy and every stem in India…… owes much to Kapila, perhaps the greatest name in the history of India in psychological and philosophical lines….. Even if it is thousands of years back, yet he stands there, the shining, glorious, wonderful Kapila". The Bhagavadgita also lauds Kapila as the foremost among the Sages: *Siddhanaṁ Kapila runih.*

The Yoga System

"Yoga is not just a philosophy; it is an applied practical science. Philosophy gives us knowledge; Yoga gives experience with knowledge or experiential-knowledge. This is the beauty of Yoga, that the experience which it gives is a manifestation of our inner being", said Swami Satyananda Saraswati. Yoga can be practiced by any one, at any level, for any reason, for any time span, for any small or big, important or trivial or subtle need, without any conditions applied. Therefore, Gheranda Saṁhita says, 'No force is as powerful as Yoga', Sage Gheranda has visualized yoga in the form of energy through which life's shortcomings can be eradicated. Through its force the whole personality-the body, mind, intellect, thoughts, emotions and behaviors can be moderated, balanced and brought under control. It is true that 'Yoga' is multi-faced, whosoever, living at any level of existence, needs something to deliver him solution, something which can render peace, relaxation, quietude or freedom from suffering then yoga has 'that something' to offer. Ṛsi Patanjali said Yoga means, 'Yogaḥ cittavrtti Nirodhah'. The beauty of Yoga is a state of mind which has no modifications, therefore, it is said 'Yoga is a state of Samadhi i.e. Self As It Is'. (*Svarůpa Avastha*). So, Yoga is the practical aspect of the method of mental control by which the philosophical ideal of the *Sāṁkhya* namely, the isolation (*Kaivalya*) of the Spirit from Matter is achieved.

"Yoga aims to take one from the impure aspect of mind towards the pure aspect, from a state of scattered desire to a state balanced desire, where the desire does not limit us to the external environment only, but also encompasses the inner dimensions. By transcending the impure mind and obtaining purity of mind and by awakening the faculties of the pure mind, one attains transcendence or *mukti.* One must go the impure to the pure and awaken the faculties of the pure mind and in order to attain transcendence," said Swami *Niranjanananda.*

Sage Patanjali gave the science of medicine for the health of the body, the science of grammar for accuracy of speech and the science of Yoga for the well-being of the soul. He said the 'Astanga Yoga' which frees man from his helpless entanglement in the currents of egoity, desire and ignorance by a progressive discipline of rejection, purification, detachment, observation, concentration, meditation, and absorption is subtler and still subtler states of consciousness fill all the coverings of Nature are set aside one by one and an identity is gained with his pure 'self' which is forever free.

The Mimāṁsā System

The school of Mimamsa is theology divided into two parts, one in the form of questions and the other in the form of answers. (Uttara and Poorva Mimamsa). Mimāṁsā is known as '*Vākya Sāstra'* (The science of sentence) which is the interpretation of texts. It is related to the karm-kanda (Saṁhitā and the Brāhmana perform of the Vedas).

Sage Jaimini the well-known promulgator of one of the six orthodox systems of Indian knowledge. Jaimini's '*Mimāmsā Darśana'* and '*Vedic Saṁhita'* discusses duty and the Dharma in its various aspects. The Mimāṁsa system is a natural growth and development of the 'Brāhmana' literature in one of its aspects. Jaimini has defined as an act or a set of acts known on the authority of the scriptural text alone (*codanalaksanah*) and is at the same time conducive to human well-being (arthah). The Miṁaṁsa accordingly holds that Śabda, word (and *codanā* is *sabda*) is self –authentic. Hence Vedic word, science is above all human contact, and so, it can't be invalid. It is invariably valid. Jaimini established the rules of Miṁāmsa to examine the nature of dharma. The Veda enjoins the act of duty, specifying at the same

time the beneficial results which follow from their performance of religious duty.

The Vedānta System

Vedanta translates literally as the 'end of perceivable knowledge'. It is comprised of the two root words, 'Veda' and 'anta' means 'the end'. This is the experience of the mind which is exploring its own limits and gaining a realization and an understanding of that exploration.

The schools of Vedānta trace their origin to the Upanisads which have justly been called the Himalayas of the soul. The term "Vedanta" means "the end of the Veda" or the closing part of the Vedas, which are the Upanisads. The Upanisads themselves are called Vedanta, because they constitute the end of Veda. The Sutra for Vedānta was the work of *Bādarāỳaṇa* whom Indian tradition identifies with *Vyāsa*. Therefore, he is known as Veda- *Vyāsa*. He endeavors to show that the cumulative teaching of the Upanisads is that the supreme reality is 'Brahman-Atman', that this is the ground of the universe. Brahman is the ultimate reality. Brahman in itself is attributeless, formless. It is because Brahman in itself is unconditioned that scripture indicates its nature via negative as "not thus, not thus", and says that it is not what is manifest.

The Mimāmsā and Vedanta go together because of their common Vedic basis but otherwise they differ fundamentally. Mimāmsā is concerned with karma and dharma and Vedanta to the renunciation from activity. The Vedanta is concerned with knowledge (*Jnāna*) which is the means of Release (*Moksa*).

These philosophical systems may have been devised in the ancient times, but they continue to be relevant in the contemporary world. The focus on IKS intends to pass on the knowledge of the ancient times, that is so often inscribed in Indian scriptures, to the current generation of learners, so that they can also benefit from their practical and spiritual wisdom. The *Katha Upanishad* contains the famous quote:

"Those in whose hearts OM reverberates
Unceasingly are indeed blessed
And deeply loved as one who is the Self.
The all-knowing Self was never born,
Nor will it die. Beyond cause and effect,
This Self is eternal and immutable.
When the body dies, the Self does not die."

Om is the quintessential Indian Knowledge, in that one immutable syllable it contains the veracity of Indian Knowledge systems. These systems will never die, their validity and significance will continue to live on. Our future generations will surely benefit from accessing and learning from Indian Knowledge Systems.

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Using Etymology as a Teaching Strategy for Meaningful Learning

Rakhi Sawlani*

Etymology is the study of the origin of words, historical perspectives, and modification in the meanings of these words (Longman Dictionary of Language Teaching and Applied Linguistics, 2010). It is the systematic study of the birth, roots, and time-to-time changes in the forms and implications of words (Ross, 1962). This approach is a naturalistic way of learning words and eventually learning the whole concept easier and faster. It is based on the premise that each word has a history, tells a story, and expresses about itself. Each word gives background information about its intended use and purpose. The etymology of a word typically starts with the main word called the root that explains the majority of its meaning for instance, the root word of *research* is '*search'*. When the root word and additions in the form of suffixes and prefixes are recognized, etymology further investigates its history to know about its origins in other languages and the way it is viewed by different countries in different contexts. It also encompasses dates representing the first time a particular word appeared in any document like late 14c., mid-15c. The word "etymology" itself has Greek roots '*etymologia*' (Fig 1).

It accelerates learning new words through the comparison and contrast of each foreign word similar to their native language. The students understand the similarities between languages and try to get the accurate meaning of those words. In this way, the students create links between English words learned and their native language.

Theoretical Grounds

Learning is a continuous process that takes place in an external environment. It involves responding to signals, attending, and looking for connections and meanings for individuals to act. Ausubel's Learning Theory (1968) stresses the importance of relating new information with the existing (old) knowledge structure for meaningful learning. According to him, Meaning is a conscious experience that occurs by incorporating effective signs, symbols, concepts, or prepositions within an individual's cognitive structure. Ausubel argued that meaningful learning (opposite of rote learning of words) takes place when the learner makes connections between concepts and new learning is linked to other known areas of learning to be transferred to long-term memory. He considered a few conditions crucial for meaningful learning: learning material must be logical; knowledge is hierarchically organized and new information is meaningful to the extent that it can be related to what is already known. Based on these criteria, Etymology could be considered as a real spirit behind meaningful learning in constructive classrooms.

Herbert Pierson (1989) studied that word origins attributed to meaningful learning and a meaningful approach to the etymology of words, prefixes, and suffixes. The knowledge of roots offers an advanced level of both practical and theoretical linguistic knowledge necessary for the permanent retention of words and concepts. Etymological training benefits language instruction offering meaningful linguistic information.

While learning the concept, learners study the parts of words such as stem, prefixes, and suffixes, make connections between related words in the context, strengthen the connections between people, places, events, cultures, languages, and races, and work out the in-depth meaning of those words (Nation, 2001). The schema theory asserts that learners activate relevant schema to interpret new topics quickly and effectively. Schemata act as a reference store to retrieve relevant existing knowledge into which new information is assimilated (Richards and Schmidt, 2002).

Prior Studies

Research studies have examined the effectiveness of teaching word roots to learners using etymology. These studies establish the potential gains of adopting the etymological approach as a vocabulary learning

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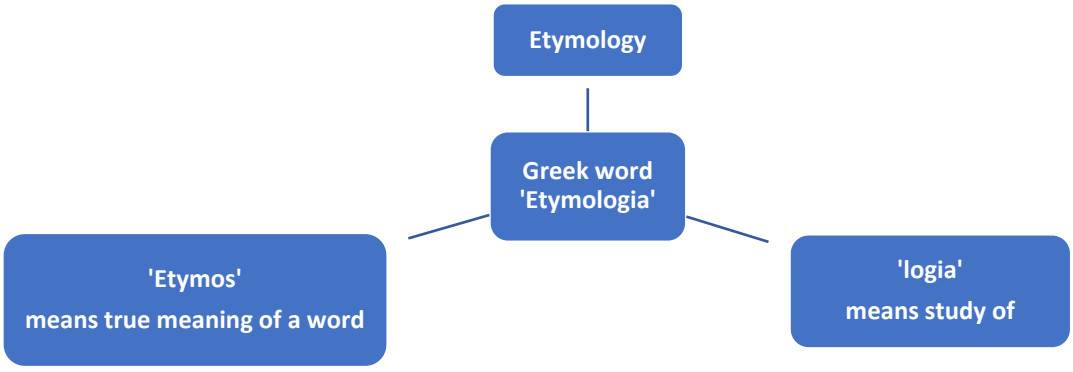
Fig.1 – Etymology of Etymology



technique to enhance learners' receptive vocabulary. Zolfagharkhani and Moghadam (2011) concluded the positive impact of etymology on students by improving their reading speed, comprehension level, communication, vocabulary, and the quality of language in writing and speech. It aids in analysing word parts leading to inferring the meaning of a word from its original form. It has significantly higher word knowledge gains than traditional vocabulary classroom teaching methods making teaching teaching-learning process productive and diverse. By using this approach, learners can understand thousands of unknown English words as they can break the building blocks of the word to reach its meaning. Learners make full use of the word families they know and remember new complex words. Using etymology in teaching vocabulary has notable results in stimulating word retention (Pierson; 1989; Soleimani and Azizmohammadi, 2015). This is because learning about etymology is learning about the origin and history of a word enabling learners to associate the target words with existing knowledge in the mind.

Etymological Analysis as Fast Word-attack Strategy

The words in English are derived from various languages such as Greek, Latin, Italian, French, and Old English and many are formed by adding prefixes and suffixes. The teacher and students get awareness of the meaning of words and their relationships with other words from both history and other languages. The knowledge of the words, their meanings, and their relationships with other words contribute a lot according to educational psychologists. They help in meaningful learning as they connect prior learning, and thus are more likely to be retained and generalized to other learnings. Etymology helps students understand words in a more complete lasting way and the meaning makes far more sense than the definitions that students memorize. For instance, the root word *tangere*, means "touch." The prefix *in–* stands for negation. So, the word *integer* means 'untouched' or 'whole'.

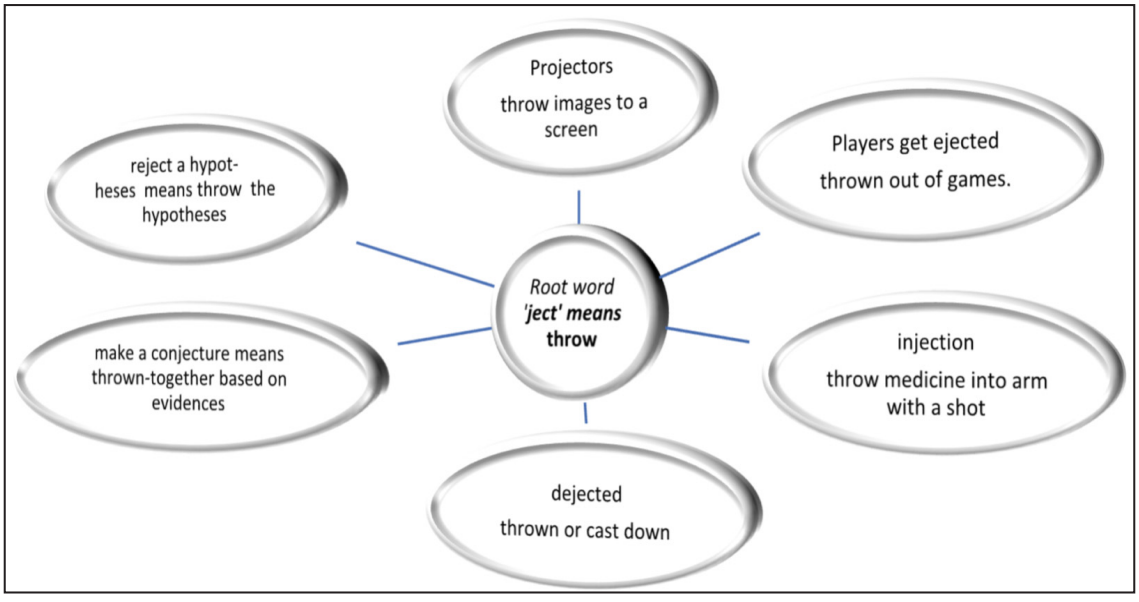
The etymological analysis of the words helps in recognizing their origin such as borrowing the words from other languages and their formation. It covers four parts: (1) original words; (2) word structure; (3) word formation; and (4) cognitive analysis of word formation and evolution. The figure-2 shows an etymological analysis of the root word *'ject'* from which many other words arise like *reject, deject, eject, project, projector, conjecture, inject, injection, object, subject, interject, trajectory, jet, jettison* that closely means to throw under various contexts.

Steps of Etymological Analysis

Etymological elaborations about the history and origin of the word as well as studying the word parts results in meaningful learning of the concept. The etymological approach narrates a story about the word origin with a knowledge of older versions and other derivatives eventually creating more word associations in the learner's mind, leading to easier activation of schema. It helps in the retention of language by making several associations of the word in learners' schemata. Thus, the word will be easily retainable if the story behind it is told. (Baleghizadeh and Naeim, 2011).

- Each target word (in a concept) is defined in a contextual story about the history, root word

Fig.2: Etymological Analysis of Latin Root Word 'Ject'



analysis, origin, and relation of that word with other languages to infer its meaning.

- The story could be relatable to existing knowledge in which the schema of the learner will be activated then learners will be introduced to other related words.
- The story stimulates non-verbal reactions/feelings in learners towards the target words.
- The story creates an additional pathway for recall by storing the etymological information as a mental image.
- Finally, the target words will be analyzed based on their parts and relate those parts to other potential target words to maximize the overall attainment of concepts.

Strengths of Etymological Analysis

Etymology must become an integral part of classroom instruction while lesson introduction, interaction, assessment of the concept, linking new knowledge to the previous knowledge of students during delivery of the content, developing learning material (print/online), preparing lesson plans, designing teaching strategy, equipping new skills. The benefits of etymological analysis are as follows:

Looking for the Root Word

Etymology helps in knowing the roots of a particular word and other words with similar roots. For instance, the word 'logia' is popularly seen in multiple places in modern English, from "biology" to "astrology. Hence it helps in generalising the fact that knowledge exists as a whole. Etymology also traces how the word meanings and spellings have developed over time (Borrowing, modification, and semantic changes), and how the word has moved through more than one language over the years.

Creating Students' Interest in the Topic

A teacher needs to provide background information on the topic basic knowledge about word roots, introduction to affixes, repetition of connected words/technical terms/specialized terminology of the field to arouse interest in the students.

Enlargement of Vocabulary

Etymology not only helps in memorizing the roots of the words but also how the word is transformed in terms of structure and meaning. It helps learners to improve in-depth acquisition/ understanding of vocabulary resulting in long-term memory. For instance, the Latin prefix *con–* means "with/together" resulting in words like *conference, consistent, connected, concur, concert, contact, contract, construct, consensus, confluence, and concatenation.*

For Language Retention

The etymological analysis helps language

learners learn new words, meaning, pronunciation, spelling, usage, quality of writing, retention, and development of language proficiency. Such acquired etymological knowledge trains language learners with a decoding tool in which unknown words are interpreted from their building blocks (root words). This knowledge is also beneficial in real-life situations helping to understand more about the external world and feel more connected with their language and other languages too. Etymological knowledge of words gives meaningful input which can help learners remember and retrieve it in the course of acquiring and applying vocabulary.

Supports Conceptual Understanding

It also trains conceptual learners to go through the etymological analysis of new words/concepts to understand their significance in the educational domain. It generates a mnemonic effect by creating a mental image of the target words (Boers, Eyckmans and Stengers, 2007) which will be stored in the brain to be accessed later. Thus, instead of rote learning, etymological information helps learners in meaningful conceptual learning.

Enhancing Intellectual Capabilities

If we know one root word, then it helps us in predicting other words arising from it. As a result, the word connection, historical information, and academic context help us in retaining the word in our mental schema forever. Research on Etymology suggests that it helps learner guess the meaning of unfamiliar words from their root words. So Etymological analysis enhances the intellectual capabilities of learners.

Encourages Differentiated Instruction

High-ability students/ Gifted students are fond of hearing the backstory and learning through wordplay. Etymology helps to build on their word strength while using the same content for the rest of the class.

Foster Critical Thinking

Having understood the etymological concerns of how a word originated, modified, adapted, and changed in its connotation, learners seldom accept things that other people often say about it unknowingly or knowingly and are less likely to say something that they don't mean.

Building Mental Flexibility

Etymology resides in the fact that nothing exists in isolation and nothing in nature is permanent. When the learners realize where words come from and how variation in the pattern of word occurs over time, it is easier to understand and accept the fluid nature of language. It enhances less rigidity in thinking about words and the grammatical rules of language. Instead, learners start appreciating the beauty of progression in language.

Amplifying Healthy Skepticism

The target word in the classroom creates neural pathways in our mind that compel learners to think about its deep meaning and the characteristics of different origins involved in it. Knowing the etymology brings the learners to a healthy scepticism empowering them to use words freely, and acceptably with a better understanding of the context.

Conclusion

Meaningful learning is a crucial aspect of academic success. The role of etymology in meaningful learning of comprehending word meaning could not be ignored. The meaningful learning theory proves the practicability and positive impact of etymology on the teaching and learning process. In a nutshell, it can be said that etymology is a valuable tool for understanding the unknown words encountered by students (Anttila, 2000). It not only teaches the origin of words but is also helpful in understanding how language takes shape. The Etymological training in the classroom could contribute significantly to making learning more competent and confident for the learners.

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(contd. on pg. 26)

Water Quality of Ami River : A Study

Divakar* and Anil Kumar Dwivedi**

Water, an indispensable resource for both industrial and agricultural sectors [1], lies at the core of life's sustenance not only for humans but for all living organisms, from animals to plants [2]. The intrinsic value of water extends beyond mere survival; it profoundly influences the quality of life. In conjunction with the surrounding land, oceans, rivers, lakes, and streams form the canvas upon which life unfolds and interconnects. The ecological equilibrium, intricately woven by both the quantity and quality of water, ultimately defines the way of life for communities and the health of their environments. Despite its vital role in supporting life, contaminated water seriously threatens all forms of existence [3]. In the Indian context, water pollution is a pressing issue, affecting major rivers across the country [4]. As determined by its physical and chemical constituents, river water quality is pivotal in ascertaining its suitability for diverse purposes such as irrigation, public water supply, and industrial applications [5]. A comprehensive survey of river ecosystems reveals a concerning pattern - small and large areas along the riverbanks serve as repositories for toxic waste, leading to rampant pollution. Human activities such as releasing sewage toxic metals and using pesticides and fertilizers in farming have severely polluted water, endangering marine life and plants [6]. Studies such as those conducted by Singh and Rai [7] on the industrial effluents and domestic sewage's impact on the Ganga River in Allahabad reveal alarming pollution parameters that far exceed permissible limits, rendering the water unfit for human consumption. Tiwari's [8] investigation into the pollution potential of the heavily contaminated River Pandu, laden with industrial effluents, underscores the gravity of the issue. Furthermore, Gupta and Pankaj [9] delve into the troubling concerns of eutrophication and heavy metal pollution in rivers Ganga and Gomti, ascribed to human activities. Our study examines water quality in the Ami River, analyzing pollution's impact and implications for resource management to benefit humans and the environment.

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Study Area

This study focuses on the Ami River, a watercourse stretching approximately 147 kilometers and enveloping an area of around 5,000 hectares across 330 villages. This river is pivotal in the region, playing a significant part in a vital aquatic ecosystem's social, environmental, and economic dimensions. In terms of geography, the Ami River basin spans from 26°31'N to 27°15'N latitude and 83°26'E to 83°35'E longitude.

Collection of Samples

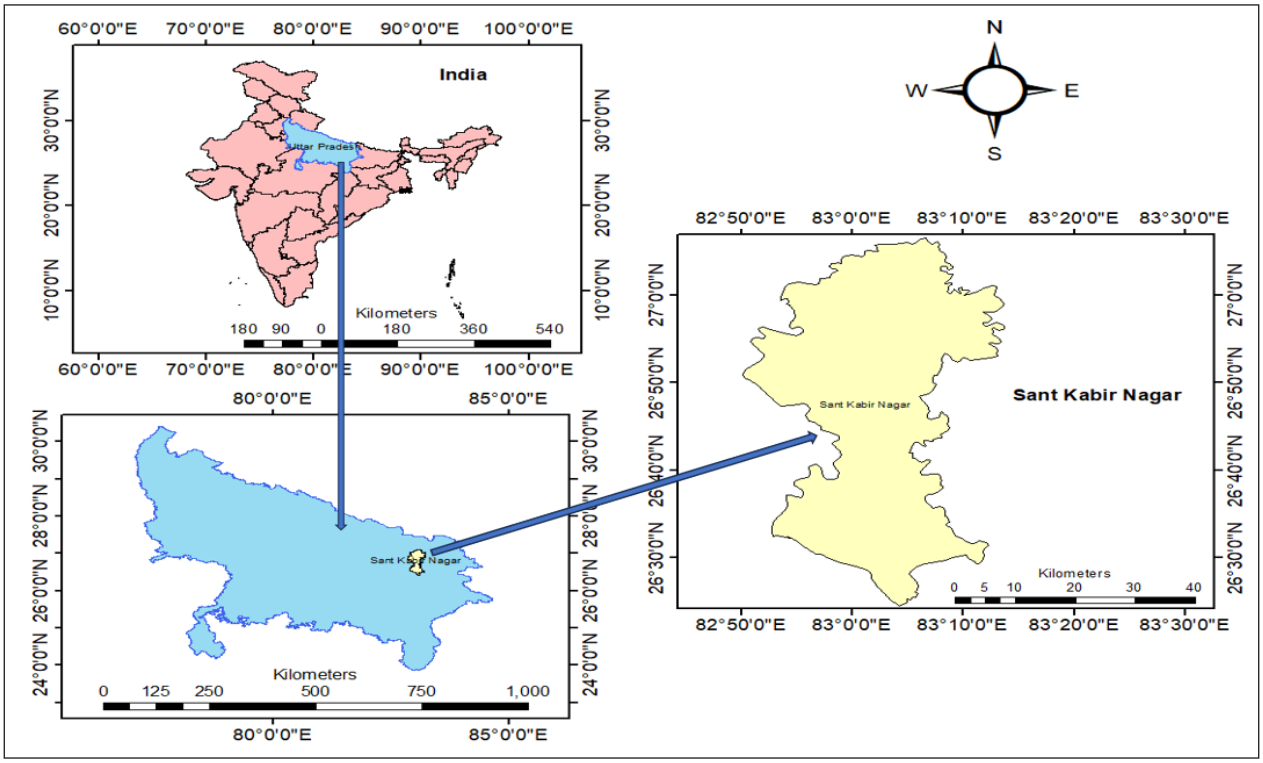
In 2022, two sites of Ami River were chosen randomly for collecting water samples, which was carried out on two occasions: pre-monsoon and post-monsoon periods. The samples were taken with care using 500-milliliter plastic containers from a depth of one foot below the river's surface. The samples were collected carefully from two locations at each sampling site and then thoroughly mixed to achieve a balanced representation. A quick trip to the refrigerator helped keep the samples stable and stopped any further biological reactions.

Sample collection was conducted early, specifically between 8:00 and 10:00 a.m. After their collection, each sample underwent comprehensive analysis following the standards delineated by the American Public Health Association (APHA) [19]. The precision of the results was ensured by carefully preparing the reagents using double-distilled water. In the laboratory, a detailed analysis was conducted on eight major water quality indicators, which comprised pH, Total Solids, Electrical Conductivity (EC), Dissolved Oxygen (DO), Chloride, Alkalinity, Hardness, and Biological Oxygen Demand (BOD). The thorough assessment of the Ami River's water quality was based on this meticulous monitoring and analysis.

Methodology

The present study analyzes the patterns and fluctuations seen in the chosen water quality

Fig. 1. Geographical Position of the Study Area
(Sant Kabir Nagar, Maghar, Uttar Pradesh)



metrics of the Ami River. The primary objective of this study is to determine the levels of quality parameters. If no discernible influence from any source is observed, these values can be used as baseline measurements [10]. Various specialized tools and procedures are employed to measure water quality parameters accurately. The determination of pH level is accomplished through a pH metre, which evaluates the acidity or alkalinity of water. Electrical Conductivity (EC) is measured using a conductivity meter, which assesses the salinity of the water. The determination of Total Solids content involves the process of evaporating a given water sample and subsequently quantifying the remaining material. The measurement of alkalinity in water is often determined using titration and electrometric techniques, which assess the water's ability to resist changes in pH, also known as its buffering capacity. The determination of water hardness, indicative of the levels of calcium and magnesium ions present, is often conducted using the titration method involving EDTA. The quantification of chloride concentrations, frequently linked to human-induced contamination, is determined via a titration methodology employing silver nitrate. The measurement of Dissolved Oxygen, which is a crucial parameter for assessing the capacity of water to sustain aquatic organisms, is conducted by the Winkler method with an azide alteration. Finally, calculating Biological Oxygen Demand (BOD) involves a five-day incubation procedure, quantifying the extent of organic contamination. When utilized collectively, these methodologies provide a thorough comprehension of water quality.

Results

Table 1 represents a detailed analysis of the water quality in the Ami River. It indicates the measured values of important parameters at Site-I and Site-II, covering both pre and post-monsoon periods. Several essential insights emerge when comparing these values to the World Health Organization (WHO) standards [11]. Firstly, the pH levels at both sites consistently fall within the recommended range, reflecting stable water acidity/alkalinity and suitability for various purposes. Though not accompanied by a specific WHO standard, electrical conductivity values remain within acceptable limits. This is a positive sign as it indicates relatively low salinity levels in the water.

Table 1. Site-specific Observed Values of Water Quality Parameters of Ami River

Parameters with unit	Location-I		Location-II		WHO Standards (1984)
	Pre-MS	Post- MS	Pre- MS	Post- MS	
	Range	Range	Range	Range	----------
pH	7.5-8.2	7.1 – 7.6	7.9-8.6	7.1 -7.4	7.0-8.5
Electrical conductivity (µs/cm)	2.8-3.5	2.4-3.2	2.7 – 3.3	2.3 – 3.2	--
Alkalinity (mg/ l)	126- 201	110 -153	136 - 163	119 - 171	120.0
Total solids (mg/ l)	726 - 802	512 - 689	841 - 901	498 - 639	500.0
Hardness (mg/ l)	127 - 174	112 -163	136 - 162	99 - 123	100.0
Chloride (mg/ l)	189 -209	161 -192	171-256	156 -235	250.0
Dissolved Oxygen (mg/ l)	6.1- 7.2	7.1 -7.9	6.2 -6.8	6.9 - 7.2	5.0
BOD (mg/ l)	6.8 – 7.1	4.9 – 5.2	6.1 – 6.4	5.3 – 5.9	6.0

MS= Monsoon Season

Alkalinity values are notably close to the WHO standard, suggesting the water can resist drastic pH changes and maintain stable conditions. Total solids, a measure of suspended particles in the water, stay within the WHO's acceptable range, indicating reasonable water quality. Hardness values, which show the concentration of minerals, also comply with the WHO standard, implying that the water is relatively soft and suitable for various applications. Chloride levels fall within the recommended range, ensuring the water is appropriate for consumption and other uses. Dissolved oxygen levels exceed the WHO standard, highlighting excellent oxygen content in the water, which is crucial for supporting aquatic life and overall water quality. While Biochemical Oxygen Demand (BOD) values mostly align with the WHO standard, some deviations are observed. This parameter reflects the degree of organic pollution in the water, and while the deviations are minor, they warrant attention to maintain the river's water quality.

Discussion

Examining data about multiple water quality criteria in the Ami River yields encouraging results about its potential appropriateness for drinking and irrigation applications. The pH levels at Site-I and Site-II during the pre-monsoon and post-monsoon seasons consistently adhere to the normal range of 7.0-8.5, as defined by the World Health Organization (WHO). This indicates that the water's acidity and alkalinity are well-balanced, making it appropriate for various uses. Changes in pH that can be seen from season to season are caused by bacterial blooms, but they stay within safe limits. The highest pH levels may be because of more photosynthesis in the algae blooms in the summer, which causes calcium and magnesium carbonates to form from bicarbonates [12]. These seasonal fluctuations are critical in line with Das, et. al. [13] as they directly affect fish growth, appetite, and food conversion ratios. Electrical conductivity (EC) values, although not accompanied by specific WHO standards, are well within an acceptable range at both sites. This suggests that the water's salinity, reflected by EC, is at levels suitable for irrigation and other applications. Seasonal variations are noticeable, but the data indicates relatively low to moderate salinity levels, in line with previous research by Singh, et. al. [10].

The alkalinity values at both sites and during both seasons closely adhere to the WHO standard of 120.0 mg/l. This signifies that the water has a robust buffering capacity against pH changes. The observation of high alkalinity in water suggests the existence of both weak and strong bases, including carbonates and bicarbonates. Changes may affect the river's alkalinity and carbon dioxide levels over time. High alkalinity indicates the presence of various bases like carbonates and hydroxides in the water [14]. The elevated alkalinity levels seen at Ami River may be attributed to a concurrent rise in free carbon dioxide concentration, ultimately leading to the observed increase in alkalinity.

Dissolved Oxygen (DO) levels consistently exceed the WHO standard of 5.0 mg/l at both sites and during both seasons, indicating excellent

oxygen content. This is vital for supporting aquatic life and, in line with Mathur, et. al. [15], underscores the river's ecological health. Biochemical Oxygen Demand (BOD) values align with the WHO standard of 6.0 mg/l. The data intimates that the water quality, specifically regarding organic pollution, is predominantly within acceptable limits. The observed minor fluctuations potentially signify sporadic instances of organic pollution, echoing the findings presented by Wolfram, et. al. [16].

Total solids, representing suspended particles in the water, consistently fall within the WHO standard of 500.0 mg/l at both sites and throughout the seasons. This suggests that the water contains an acceptable concentration of suspended particles. The wide range of natural and anthropogenic factors can influence alkalinity levels in Indian waters, as observed by Jhingran [17]. Hardness values at both sites align with the WHO standard of 100.0 mg/l. The data indicates that the water is relatively soft and suitable for various uses. Although some variation is noted, especially during summer, the water's hardness remains within acceptable limits. Excessive water hardness during summer could be attributed to increased salt concentrations due to excessive evaporation [18]. Chloride levels are well within the WHO standard of 250.0 mg/l at both sites and during both seasons, making the water suitable for consumption and irrigation. The presence of chlorides may be attributed to local effluent discharges, which can moderately raise chloride levels. This observation aligns with previous research by Singh, et. al. [10].

Conclusion

In this study, the water quality in the Ami River appears to be generally suitable for drinking and irrigation purposes. The observations for key water quality parameters such as pH, chloride, alkalinity, hardness, total solids, and dissolved Oxygen consistently fall within or very close to the World Health Organization (WHO) standards and acceptable ranges. These parameters indicate that the water is neither too acidic nor alkaline, possesses good buffering capacity, contains a reasonable number of suspended particles, has relatively low mineral content (soft water), and is free from excessive chloride, all of which are positive for drinking water. Furthermore, the dissolved oxygen levels significantly exceed the WHO standard, indicating excellent oxygen content in the water, which is crucial for supporting aquatic life and, by extension, the river's ecological health. While the Biochemical Oxygen Demand (BOD) values show minor variations, they mostly align with the WHO standard, suggesting that the water quality in terms of organic pollution is generally acceptable. However, continued monitoring is advisable to ensure consistency in water quality. Without specific WHO standards for Electrical Conductivity (EC), the provided data indicates that EC values are within an acceptable range, suggesting low to moderate salinity levels. Therefore, the study indicates that the water in the Ami River is suitable for both drinking and irrigation purposes, with some minor seasonal variations and occasional deviations in parameters that may warrant ongoing monitoring and management. Nevertheless, for any specific use, it is recommended to consult with local authorities and conduct further, up-to-date water quality assessments to ensure the safety and suitability of the water for the intended purpose.

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Journey towards Technology-led Transformations

K Sanjay Murthy (IAS), Secretary, Department of Higher Education, Ministry of Education, Government of India delivered the Convocation Address at the 42nd Convocation Ceremony of the Dayalbagh Educational Institute (Deemed-to-be-University) Dayalbagh, Agra on January 20, 2024. He said, "Although the world you are stepping into is fraught with challenges yet is also replete with opportunities. The skills you have honed here, the values you have imbibed, and the knowledge you have acquired are your tools to navigate this complex world. You are equipped not just to succeed in your respective fields but also to lead the way in creating a more just and humane society." Excerpts

I am privileged to be a part of this important juncture in your lives, when you are all set to spread your wings and fly off into the vast unknown future. This is the moment when we, your elders, your institution, your parents jointly express our faith and confidence in you. We let go of our guiding hands so that you can soar unhindered and unfettered. A convocation does not merely bestow an academic degree on you, it is a declaration that you young men and women are ready to take on life as mature, well adjusted adults.

Friends! You are entering the world at a time when it is transforming at an unprecedented speed. There are technology – led transformations which have totally changed the way people connect and communicate with each other, interact with their physical ecosystems, and the kind of work they are required to do. Artificial Intelligence is making inroads into our lives in ways that we are yet to fully comprehend. Developing competency in critically emerging technology is something that has become more than imperative. Globally, as on the G20 platform, or the connect with the Global South we have recognized the need for countries and societies to work together on issues of common concern, find research-based solutions to common problems, map global skill requirements for the upcoming future and empower our youth with relevant competencies.

Nations have committed to sharing of best practices, resources, knowledge and a lot more on these platforms. Yet, at another level there are political upheavals brought on by widespread conflicts in multiple regions of the world that are constantly working to divide the world. Within our own country also, we encounter such contradictions. On one hand we have a lot to feel proud of - being world leaders in our *digital programmes* through which we have empowered crores of our citizens ; our *moon, mars, sun and other space explorations*; our exemplary management of the *Covid pandemic* not just for ourselves but for many countries of the world through *vaccine maitri*; our *Ujjwala* programme that has brought succour to so many of our rural women; our *Jan Dhan yojana, Ayushman Bharat yojana* and so much more. Yet, we see widespread disparities among people in their access to opportunities and resources; we see conflicts on very meaningless issues like caste, religion, language, regionality.

Making sense of such contradictions, maintaining your wisdom, compassion and equanimity and working to realize your potential in your chosen area may be a very challenging task, but something I am sure each one of you who is coming out of the august institution is fully equipped for. I am sure each one of you has been shaped profoundly by your educational journey through Dayalbagh Educational Institute.

As you commence on your aspirational march across Amrit Kaal today, it is an opportune moment to note the remarkable transformation of our educational ecosystem under the National Education Policy of 2020. This revolutionary policy has laid the path for establishing India as a vibrant knowledge society and is preparing every young Indian to face the challenges and opportunities of the 21st century as they lead the country towards Atmanirbharta. Within three years of its launch, we have made impressive progress towards establishing the accessible, inclusive, futuristic, flexible, multidisciplinary and quality education rooted in Indianness that NEP 2020 has envisaged. The higher education sector has rejected its rigid, discipline-linked, straight jacket to adopt flexibility with opportunity for lifelong learning. Multidisciplinary programmes, options for multiple entry exit through an Academic Bank of Credit, choice of online programmes, provision of Joint, Dual and Twinning degrees with foreign universities will now make it possible for students to study as per their convenience and choice and help them nurture their competencies in consonance with global

requirements. Students now have the choice to move between skill and academic streams, do their partial study in Indian and foreign institutions, study multiple courses simultaneously, or do their studies in online mode. We have now allowed even foreign universities to set up campuses in the country, so that you can have access to a wider choice of quality institutions in the country. What is more, you also have the choice of learning even complex subjects like Engineering in your mother tongues and taking common entrance exams to various courses in 13 Indian languages. The growing vibrancy of our research and innovation ecosystem and the improving governance structures are evident in the global ranking of our educational institutions that is continuously improving every year. I am confident that all these transformative reforms will define and lead the progress of the country through *Amrit Kaal.* Also, as envisaged by the policy, we are promoting the spirit of *Ek Bharat Shreshtha Bharat* through programmes like *Yuva Sangam, Kashi Tamil Sangamam* and other regular programmes with paired states in which many of you may have participated.

I am very happy to know that DEI has been at the forefront of implementing the reforms proposed by NEP 2020. The DEI Education Policy 1975, envisioned by the Founder Director Revered Dr M B Lal Sahab, embraces the same holistic vision of nurturing the mind, body, and spirit as that of the NEP. I wish to congratulate DEI on the progress it has made in contribution to all the seventeen United Nation's Sustainable Development Goals making a remarkable impact in Quality Education, Good Health, and Well-being.

It is heartening to note DEI's active participation in several key projects under the aegis of the Ministry of Education including the Virtual Labs in collaboration with IIT Delhi, the Enterprise Resource Planning (ERP) with IIT Kanpur, and the creation of software tools with IIT Roorkee. DEI's Quantum and Nano Computing Virtual Centre is pivotal in the development of low-cost synchronization oscillators for standalone communication networks, which aligns with the nation's goal to enhance its technological infrastructure is a commendable sign of progress. These projects showcase DEI's contribution to India's educational and research landscape and reflect a strong synergy with the Ministry's vision for empowering HEI's.

DEI's commitment to nation building, philanthropy and environment consciousness is evident in their endeavour to reach the tribals in Madhya Pradesh and the interiors of Tamil Nadu, the way they have been looking after the well being of the rural people of the surrounding villages through the DEI NSS Free Medical and Rural Assistance Camps and in the deployment of Green and Renewable energy on a large scale in the institution and their initiative to clean and enrich the banks of the river Yamuna. This forward-looking approach resonates with the educational ethos of Dayalbagh, which emphasizes character building along with knowledge acquisition.

Nurtured under an institution like DEI, as you stand on the threshold of a new beginning, you carry with you not just a degree but a legacy. You are the bearers of a vision that sees beyond the confines of classrooms and textbooks. You are the architects of a future that is more equitable, more inclusive, and more attuned to the needs of a diverse society.

Although the world you are stepping into is fraught with challenges yet is also replete with opportunities. The skills you have honed here, the values you have imbibed, and the knowledge you have acquired are your tools to navigate this complex world. You are equipped not just to succeed in your respective fields but also to lead the way in creating a more just and humane society.

As you embark on this journey, remember that education is a lifelong pursuit. The world is your classroom, and every experience is a lesson. Stay curious, stay compassionate, and stay committed to the ideals of equity and inclusivity. As you move ahead, never lose sight of the fact that there are many young people out there who have not been as fortunate as you in life. Youth who have not had your opportunities. These young people need your support, their welfare needs to be a part of your vision and your endeavour in life.

To conclude, I would like to extend my heartfelt congratulations to each one of you. You have made us proud, and we are excited to see the paths you will carve out for yourselves and the heights you will reach. Go forth with courage, with conviction, compassion and with a heart full of hope.

Thank you ! ❑

National Seminar on Indian Knowledge System, Teacher Education and NEP-2020

The one-day National Seminar on 'Promoting Teacher Training according to the Indian Knowledge System and its Relevance to National Education Policy-2020' was organised by the Shiva College of Education, Barota, Bilaspur, Himachal Pradesh in collaboration with Vidya Bharti Uchcha Shiksha Sansthan, Himachal Pradesh Chapter on December 22, 2023. The seminar was inaugurated by Prof. Sat Prakash Bansal, Vice Chancellor, HP University Shimla, and Central University of Himachal Pradesh, Dharamshala. The Managing Director of Shiva Group of Institutions, Er. Purushottam Sharma, Prof. Surender Kumar Sharma, Department of Education (ICDEOL), HP University Shimla, Former Member of NRC, NCTE, New Delhi, Chairman CTEF HP Chapter & Chairman Vidya Bharti Uccha Shiksha Sansthan HP Chapter and Principal of the College, Dr. Sunil Kumar Sharma welcomed Chief Guest, Invited speakers, Resource visionaries and participants from different institutions of higher education across the country. In his Inaugural Address, Prof. Bansal emphasized the need to hold such talks and serious discussions on provisions for Teacher Education envisioned in NEP-2020. He said that the New Education Policy - 2020 will take India to new heights of development in the field of Education. Explaining the difference between the education systems of other countries and India, he said that we need to work towards nation-building. For this, along with value education, we will also have to move forward in science and technology. The 400 million young population of the country is moving forward with energy and enthusiasm and the role of teacher is very important to utilize it in the right place.

The Former Dean of Studies, Himachal Pradesh Technical University Hamirpur and Himachal Pradesh University Shimla, Prof. Kulbhushan Chandel presented the Keynote Address. In his address, Prof. Chandel described the Indian knowledge tradition as an integral part of Indian education and said that Indian epics Mahabharata, Ramayana, Indian Vedas contain complete subjects' knowledge in themselves and should be necessarily taught in educational institutions. In the new National Education Policy 2020, it has been given a lot of priority and now it is the responsibility of the teachers to bring it to completion.

The Technical Session was Chaired by Prof. Kuldeep Singh Katoch, Department of Education (ICDEOL), HP University Shimla, and Member, NRC, NCTE New Delhi. In the opening session, he threw light on the different aspects of Teacher Education that need a review of practices and attracted the attention of participants to the upcoming challenges before Teacher Educators.

Dr. Suresh Kumar Sharma, Associate Professor, SVN Govt. PG College Ghumarwin presented his paper on 'Nation First-character Must' in which he emphasized the importance of value education. Dr Kulwant Singh Thakur presented his paper on 'Need of Teacher Education according to the Indian Knowledge System in India a Path Ahead with a NEP-2020'. Dr. Kuldeep Chandel, Principal, SVN College Tarakwari presented his paper on 'Effective Teaching Practices and Their Benefits' and shared some innovative ongoing practices with examples. Dr. Ajay Kumar Sharma, Assistant Professor, NCERT presented a paper on 'Bridging the Gap between Theory and Practice in Teacher Education in India'.

Dr. Munish Kumar, Assistant Professor, Hamirpur College of Education presented a paper on 'Preparing Open Minded Competent Teachers Deeply Rooted in Indian Culture and Ethos'. Dr. Babita Kalia, Assistant Professor, Trisha College of Education Hamirpur stressed the importance of teaching practice in the training period and exposing trainees to inclusive classrooms. Research Scholars from the Department of Education, HP University Shimla presented their papers on different subthemes of the event. The session was concluded by Chairperson, Prof. Katoch with a remark that Indian Knowledge Tradition is the only alternative at present to get the Indian Education System at par with global systems.

Dr. Shashikant Sharma and Dr. Ritika Sharma Associate Professors, Department of Education

ICDEOL HP University Shimla chair the next session. Ms Archna Sharma, Assistant Professor, Nalanda College of Education, Hamirpur presented her paper on developing research culture in Teacher Education and emphasized its wider acceptance by all teacher educators. Ms Champa Devi, Assistant Professor, Trisha College Hamirpur presented her paper on 'Preparing Open-Minded Teachers Deeply Rooted in Indian Culture and Ethos' and explained the importance of learning the whole world can learn from us. Research Scholars presented their papers on various topics in this session. During concluding remarks by both the Chairpersons of the session, Dr. Shashikant Sharma and Dr. Ritika Sharma emphasized the need for research culture in teacher education institutions on a priority basis. Further, they asked participants to study the Indian Knowledge System deeply and adopt good practices at the earliest.

In the Valedictory Session, Prof Kulbhushan said that discussions, dialogues, and academic talks have been a very important part of the Indian Education System and it must be continued for the coming time. The Need of the hour is to adapt NEP-2020 in letter and spirit. Its execution part must be watched seriously to have fruitful results. Teacher Education will have to play a very important role as teachers produced in the light of NEP-2020 will be the key role players in leading generations on the path of National Development. Many participants shared their valuable experiences of the Seminar. The certificates were distributed to the participants. The Managing Director of Shiva Group of Institutions Er. Purushotam Sharma proposed the Vote of Thanks and wished everyone a great time ahead. He assured us to continue holding such academic gatherings and talks in the future on different topics of high importance in Teacher Education.

International Conference on Artificial Intelligence

A two-day International Conference on 'Artificial Intelligence for Society' is being organised by the IIMT, Bhubaneswar, Odisha from May 18-19, 2024. The event provides a platform to discuss and share knowledge on information technologies, humanities, social sciences, arts, and sciences. It includes broader societal and cultural impacts of Artificial Intelligence on people. The primary goal of the event is to invite original papers from academicians, researchers, and industry practitioners across the world from the fields of Artificial Intelligence for growth and development in society. The objective of the event is to promote scientific research and developmental activities in the fields of Artificial Intelligence for growth and development in society.

The digital revolution has already changed the way people live, work and communicate. And that's just the beginning. But the same technologies that have the potential to help billions of people live happier, healthier, and more productive lives are also creating new challenges for citizens and governments around the world. From election meddling to data breaches and cyberattacks, recent events have shown that technology is changing the way we think about privacy, national security, and perhaps even democracy itself. The Topics of the Event are:

Societal Diversity

- Society Research Agenda.
- Society Challenges and Opportunities.
- Human-centered Society.
- Drivers and Enablers for Transformation.
- Human Skills in Society.
- New Leadership.
- Gendering of Skills.
- Stereotypes (Age, Gender, (Dis) Abilities).
- Accessibility of Technologies Across Borders (Countries, Societal Levels, Disciplines).
- Inequality in Software Development.
- Democratization in Technological Development.

Innovation in the Digital Age

- Open Innovation.
- Big Data Analysis.
- Innovation Development.
- Online Collaboration for Design and Innovation.
- Knowledge Visualization.
- Collaborative Online International Learning (COIL).
- Creative Teaching.
- Cross-Cultural Teaching and Learning.

- Institutional Structures for Education.
- New Learning Methods.

Healthcare Systems

- AI for Drug Development.
- Personalized Medicine.
- Electronic Patient Records.
- Care Robots, Therapy Robots.

Human-system Interaction Scenarios

- Collaboration between Humans and AI.
- Automating Knowledge Work.
- Conversational AI.
- Resilient Socio-technical Systems.
- Social Robots.
- Human-interpretable and Machine-Interpretable Modeling.
- Autonomous Driving.
- Mobility as a Service.
- Smart City.

International Collaboration

- Cultural Differences in Business.
- Cross-cultural Communication and Trust.
- Collaboration Across Borders, Cultures, and Languages.
- Digital Supply Chain.
- Future Banking.
- Sustainable Finance.
- Digital Financial Management.
- Cryptocurrency.

Business Information Systems

- Cyber Security and Resilience**.**
- Data Privacy.
- Risk Management.
- Business Continuity Management.
- Whistle Blowing.
- Cyber-physical Systems.
- Internet of Things.
- Digital Twins.
- Digitalization of Business Processes.
- Conceptual Modeling.
- Business Integration Strategy.
- Digitalization of Products.
- Emerging Markets.
- Human Capital.
- Business Agility.
- Digital Transformation.
- Circular Economy.

For further details, contact Ms Soma Mitra, Conference Secretary, Interscience Institute of Management and Technology, Bhubaneswar-752024, Mobile No: 07978030110, E-mail: *secretary@interscience.ac.in.* For updates, log on to: *www.iimt.ac.in/event/*

International Water Conference for Sustainable Development Goals-2024

A two-day International Water Conference for Sustainable Development Goals is being jointly organised by the Department of Civil Engineering and Department of Chemical Engineering, Maulana Azad National Institute of Technology, Bhopal from March 22-23, 2024. The Event focuses on a wide range of issues of water resources hydraulics, coastal, environmental, and energy engineering with sustainability to enhance the knowledge base, increase awareness, and explore new ideas and thinking.

The Sustainable Development Goals (SDGs) have been formulated by the United Nations. Fundamental to achieving these goals is the sustainability of the nexus of water, food, energy, health, and society. Central to the nexus is water, which is thus inextricably linked to the Sustainable Development Goals, which integrate social, cultural, economic, and political values and are fundamental for the well-being and prosperity of people and the planet. In other words, water is the driver of all aspects of development. Therefore, it is logical to find a balance to ensure the sustainable development of water resources for people, economy, and ecosystems. The COVID-19 pandemic was a lesson emphasizing water quality, health, and environmental quality. Among the global population, approximately 2 billion people do not have access to safe drinking water, and 3.6 billion people live without safely managed sanitation.

Over 80% of wastewater, without being treated, is released into the environment. Indian Ministry of Jal Shakti has implemented different measures, such as adequate drinking water through individual household tap connections and proper sanitation through Jal Jeevan and *Swachh Bharat* Missions. NITI Aayog has taken the lead in bringing out the SDG India index, which provides critical insights into the status of SDGs in the country. Energy is basic to make clean water accessible to people as well as food security. Thus, human health is a function of clean water security and nutritious food security and in turn, a function of society. The course is expected to support the theme of world water-related goals and targets, including those contained in the 2030 Agenda for Sustainable Development. The Areas of the Event are:

- Ground Water and Surface Water Hydrology.
- Water Quality Assessment and Modelling.
- Water Quality for Indian Rivers and its Modelling, Irrigation Management.
- Watershed Development and Management, Rainwater Harvesting, Artificial Recharge.
- Water Resources Structures and its Management.
- Waste Water Treatment and Management.
- Fluvial Hydraulics.
- Modelling of Hydraulic Systems.
- Computational Fluid Dynamics.
- Conveyance and Water Distribution Systems.
- Climate Change and Drought Assessment and Mitigation.
- Flood Forecasting and Mitigation.
- Environmental Impact Assessments.
- Energy Conservation and Environmental Policy and Socio-Economic Aspects in Water Sector.
- Erosion, Sedimentation, Sediment Transport.
- Groundwater Modelling and Management.
- Hydraulics of Spillways and Energy Dissipaters.
- Hydrological Modelling and Forecasting.
- Irrigation and Drainage Management.
- Implementation of Emission Mitigation Technologies.
- Mathematical Modelling and Simulation Techniques in Water Resources and Environmental Engineering, Rs/Gis Applications.
- Rehabilitation of Old Dams and Earthen Dams.
- Reservoir Operation and Issues.
- Soft Computing Techniques in Water Resources Engineering.
- Storm Water Management.
- Sustainable Development: Roles of Societies, Governments, NGOs and Entrepreneurs.
- Urban Water and Drainage Management.

For further details, contact Organizing Secretary, Department of Civil Engineering, Maulana Azad National Institute of Technology, Bhopal-462003, Mobile No: 07869301978/ 09244184604/ 09425028146/ 08718064067/ 09770080208, E-mail : *iwd2024manit@gmail.com*. For updates, log on to: *http://www.manit.ac.in/*

International Conference on Corporate Social Responsibility and Decent Work

A three-day International Conference on 'Corporate Social Responsibility and Decent Work in the Era of the SDGs' is being jointly organized by the FLAME University, Pune and Wage Indicator Foundation from March 21-23, 2024.

In recent decades, decent work has increasingly been on economic and social agendas, with the Sustainable Development Goals (SDGs) explicitly linking it to economic growth in SDG 8. The International Labour Organisation built on this by framing the Decent Work Agenda around the tenets of SDG 8. Governments actively promote this too; the G20 New Delhi Leader's Declaration in September 2023 committed to the cause of decent work for all workers. Though global fora like the UN, the ILO and the G20 may place decent work at the centre of global agendas, the responsibility of implementing decent work across value chains ultimately lies with corporations. This may take the form of paying Living Wages, providing better working conditions, ensuring gender equality or supporting collective bargaining.

There is no longer a trade-off between an economy that grows and an economy that helps people thrive. So how can we achieve this? As we

stand at the halfway point between 2016 (SDG adoption) and 2030 (SDG implementation targets), it is necessary to assess how corporations can catalyse the achievement of SDG 8, and how these efforts will fit within the larger realm of Corporate Social Responsibility (CSR). The Themes of the Event are:

- The Scope of Corporate Social Responsibility.
- The Centrality of Living Wages in Enabling Decent Work and Economic Growth.
- The Role of Governments, Labour Law, and Regulation in Decent Work.
- The Power of Collective Bargaining in Ensuring Decent Work.
- The Unique Challenges of Enabling Decent Work in the Gig Economy.

For further details, contact the Organising Secretary, FLAME University, Gat No. 1270, Lavale, Off. Pune- Bengaluru Highway, Pune - 412115, Maharashtra, E-mail: *sdgconference@flame.edu.in.* For updates, log on to: *www.flame.edu.in*

National Conference on Building Multidisciplinary and Transdisciplinary Capabilities

A two-day National Conference on 'Building Multidisciplinary and Transdisciplinary Capabilities in Higher Education' is being organised by the Internal Quality Assurance Cell, Kristu Jayanti Colleg, Bengaluru from April 05-06, 2024. The Administrators of HEIs, Teachers from HEIs, Corporate Professionals, Research Scholars, and Postgraduate Students may participate in the Event.

Building the multidisciplinary and transdisciplinary capabilities in higher education is a pivotal endeavor that redefines the landscape of learning. This transformative approach breaks down traditional silos, encouraging students and scholars to explore a multitude of subjects and collaborate across disciplines. It nurtures a holistic perspective, fosters problem-solving skills and adaptability which are crucial for the complexities of the modern world. Multidisciplinary education involves integrating knowledge from various fields, allowing learners to draw connections between seemingly unrelated subjects. Transdisciplinary education goes a step further, transcending discipline boundaries to address complex, real-world issues that demand a collective effort. By embracing these methodologies, higher education institutions can equip students with broader skill sets, encouraging creativity, critical thinking, and innovation. It would foster a deeper understanding of interconnected global challenges, ultimately preparing graduates to be well-rounded, socially conscious, and adaptable individuals capable of making a meaningful impact on society. The Subthemes of the Event are:

- Promotion of SDG Goals through Multidisciplinary and Interdisciplinary Learning.
- Use of Technology in Multidisciplinary and Transdisciplinary Learning.
- Community Engagement and Outreach in Multidisciplinary and Transdisciplinary Learning.
- Role of Faculty Training in Implementation of Multidisciplinary and Transdisciplinary Education.
- The Future of Work and Multidisciplinary and Transdisciplinary Skill Sets.
- Best Practices in the Implementation of Multidisciplinary and Transdisciplinary Education.

For further details, contact Conference Secretariat, Internal Quality Assurance Cell, Kristu Jayanti College, K Narayanapura, Kothanur PO, Bengaluru–560077, Karnataka, Phone No: 080-28465611/28465353/28465770, Mobile No: 098444754568 / 08086169819, E-mail: *icon@kristujayanti.com*. For updates, log on to: *www.kristujayanti.edu.in* ❑

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THESES OF THE MONTH

SCIENCE & TECHNOLOGY

A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of Nov-Dec, 2023)

BIOLOGICAL SCIENCES

Bio Science

1. Rajan, A R Revathy. **Integrated bioprocessing of coir fibers utilizing the lignolytic gut microflora of termites and fruit extracts of Averrhoa Bilimbi**. (Dr. Anitha Das), Central Coir Research Institute, Cochin University of Science & Technology, Kochi.

Biochemistry

1. Lyngdoh, Kynshi Balakyntiewshisha. **Study of cyanobacterial isocitrate dehydrogenase under varying levels of metabolites, inhibitors and heavy metals**. (Prof. Mayashree B Syiem), Department of Biochemistry, North Eastern Hill University, Shillong.
2. Pakyntein, Careen Liza. **A study on the effects of potentilla fulgens and houttuynia cordata extracts on dipeptidyl peptidase IV and sodium/ glucose cotransporter 2 in mice under induced diabetic condition**. (Prof. D Syiem), Department of Biochemistry, North Eastern Hill University, Shillong.
3. Sachu, Meguovilie. **Evaluation of carbon and nitrogen metabolism in a cyanobacterial isolate from rice field under the influence of 2,4-dichlorophenoxy acetic acid and 2-methyl-4-chlorophenoxy acetic acid herbicides**. (Prof. Mayashree B Syiem), Department of Biochemistry, North Eastern Hill University, Shillong.

Biotechnology

1. Krishna, R Gayathri. **Functioning of glutamate and glutamate transporters in Epstein-barr virus mediated oncogenesis**. (Dr. Mohanan Valiya Veetil), Department of Biotechnology, Cochin University of Science & Technology, Kochi.
2. Nage, Nitin Bhimrao. **Design and development of broad-spectrum antimicrobial peptides as topical agent**. (Dr. M M V Baig), Department of Biotechnology, Swami Ramanand Teerth Marathwada University, Nanded.
3. Wadekar, Vaishali Nitin. **Antioxidant, anti-inflammatory and radioprotective potential of phycocyanin from spirulina platensis**. (Dr. M M V Baig), Department of Biotechnology, Swami Ramanand Teerth Marathwada University, Nanded.

Botany

1. Kamble, Bharti Kishanrao. **Studies on antimicrobial & antioxidant properties producing medicinal plant around Nanded Districts of Maharashtra**. (Dr. S V Mandge), Department of Botany, Swami Ramanand Teerth Marathwada University, Nanded.
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